Environment Canada

Performance Report

For the period ending March 31, 2003

David Anderson

Minister of the Environment

How to Read this Report

Section 1 and 2 of this report provide the Minister's Message and an overview of the Department including profile, accountability framework and measurement strategy.

Section 3 provides the reader with a balanced picture of departmental performance that is brief and to the point. It includes societal challenges facing the Department, how it is responding through definition of a priority agenda, and a summary of performance by priority area. Each priority area provides an indication of the environmental outcome indicator that supports the Department's understanding of environmental trends and issues. A synopsis is provided of Environment Canada's cumulative progress to date in implementing key strategies and initiatives that respond to societal concerns.

The extent to which cumulative progress reported can reflect direct environmental improvements or benefits is dependent on the stage of strategies being implemented. We have given a broad indication of whether departmental strategies are at a framing (policy development and scientific research), implementation (program delivery and science solutions), or initiative renewal and follow-on stage. Readers should expect that the impacts and benefits derived from departmental actions will vary in accordance with the stage and maturity of a strategic initiative. The Department continues to develop performance measurement strategies that will allow for the capture of performance information reflective of the impacts derived from strategies at different stages of maturity.

Readers who wish to review performance accomplishments in detail should continue reading through Section 4 and the many Web site links provided throughout the report. The Appendices contain details on the Department's consolidated reporting including progress on the Sustainable Development Strategy, key legislation and foundations, detailed financial information and performance measurement strategy.

Reader Feedback

We would like to hear from Canadians who read this report. Your comments will help ensure that we provide relevant information that is easily understood. Please send your completed questionnaire or comments to the mail, e-mail address or fax number shown below.

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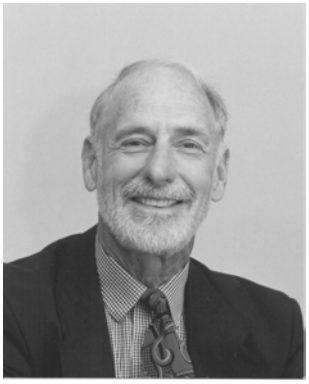
Section 1: Minister's Message



I am pleased to present Environment Canada's Departmental Performance Report for 2002-2003. The Report identifies progress made on the priorities outlined in Environment Canada's Report on Plans and Priorities for 2002-2003.

This was a year of singular achievements for those many Canadians who are concerned about the environment. Some of the most significant accomplishments were in the area of climate change. After five years of consultations, the Government of Canada released the Climate Change Plan for Canada in November 2002. In December 2002, Canada ratified the Kyoto Protocol. The Government is now working closely with Canadians to implement Canada's plan of action. The actions we take within that plan will promote innovation, a cleaner environment and more livable cities. They will also improve Canada's competitive edge.

The *Species At Risk Act* received Royal Assent in December 2002. The Act, which is based upon extensive consultations, will strengthen the protection and recovery of species at risk and their habitat in federal protected areas, including Canada's national parks. The government will continue to work with Canadians to ensure that Canada's natural legacy and its rich biodiversity are preserved for generations to come.

This Performance Report also details progress being made on other issues of concern to Canadians such as clean air and water, pollution prevention and healthy and more sustainable ecosystems and communities.

Preserving the environment is a fundamental Canadian value — a value that is shared by the Government of Canada. The importance of the environment and of sustainable development is reflected both in the September 2002 Speech from the Throne and in Budget 2003. The Throne Speech reaffirmed that the health of Canadians, our quality of life and our continued economic prosperity depend on a healthy environment. Budget 2003 provided an additional $3 billion for key environmental priorities, bringing so far, the total new funding for the environment since 1997 to $5.3 billion for federal initiatives to 2007. The Budget recognizes the need for a long-term approach to environmental planning and of integrated actions that will improve the quality of life for Canadians. It confirms that the environment is now a government-wide priority.

Canadians in all regions are acting to protect the environment. Environment Canada supports those actions through its science, its programs and its partnerships with Canadians and their communities. We will continue to strive to improve the quality of the services and information we provide to Canadians. We will also continue working through partnerships to achieve results where they matter the most — in communities across the country.

David Anderson, P.C., M.P.

Minister of the Environment

Section 2: Departmental Overview

2.1 Departmental Profile

Raison d'être: Mandate, Vision and Mission

MANDATE

The powers, duties and functions of the Minister of the Environment extend to and include matters 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; enforcement of any rules or regulations made by the International Joint Commission relating to boundary waters; and co-ordination of the policies and programs of the Government of Canada respecting the preservation and enhancement of the quality of the natural environment (*Department of Environment Act*).

- Legislation and regulations that provide Environment Canada with its mandate and allow the Department to carry out its programs can be found at: www.ec.gc.ca/EnviroRegs

MISSION

Environment Canada's mission is to make sustainable development a reality in Canada by helping Canadians live and prosper in an environment that needs to be respected, protected and conserved. To this end, the Department undertakes and promotes programs to:

Our Vision

At Environment Canada, we want to see a Canada:

- where people make responsible decisions about the environment; and
- where the environment is thereby sustained for the benefit of present and future generations.

- Protect Canadians from domestic and global sources of pollution;
- Conserve biodiversity and the ecosystems that support it; and
- Enable Canadians to adapt to weather and related environmental influences and impacts on human health and safety, economic prosperity and environmental quality.

A Focus on Science

Environment Canada's science is fundamental to the delivery of the vision and mission. Departmental efforts include research, monitoring and assessment, technology and indicators development, and reporting activities. Environment Canada uses science to:

- Understand naturally-occurring aquatic, biotic, terrestrial and atmospheric processes and their interactions;
- Evaluate and assess the effects of known and emerging stressors on the environment;
- Design and evaluate policy options for prevention, control, management and adaptation; and

- Communicate scientific knowledge and provide Canadians with tools to develop and evaluate actions to address environmental issues.

Refer to Section 3.4 for further details of Environment Canada's science-related initiatives

2.2 Departmental Accountability Framework

ORGANIZED TO DELIVER RESULTS

Environment Canada fulfills its mandate through the efforts of four results-based Business Lines: Clean Environment, Nature, Weather and Environmental Predictions, and Management, Administration and Policy.

Each Business Line is set up to deliver a long-term strategic outcome. Each desired outcome includes two or three more specific long-term goals, which, in turn, are divided into a series of distinct, achievable targets.

These Business Lines and associated long-term goals, called "key results", provide the framework for internal accountability and management as well as for external reporting. The key results also provide a stable, results-based strategic direction against which pressures faced by the Department, and shorter-term priorities to address these pressures, are organized.

Each Business Line is led by an Assistant Deputy Minister who provides leadership by building shared ownership for priorities, strategies and performance commitments across the Department.

Strategic Outcome: *Protect Canadians and their environment from domestic and global sources of pollution*	**Strategic Outcome:** *Conserve biodiversity in healthy ecosystems*
Key results: ▪ Reduced adverse human impact on the atmosphere and on air quality. ▪ Understanding, and prevention or reduction of the environmental and human health threats posed by toxic substances and other substances of concern. **Delivered through Clean Environment Business Line**	**Key results:** ▪ Conservation of biological diversity. ▪ Understanding and reduction of human impacts on the health of ecosystems. ▪ Conservation and restoration of priority ecosystems. **Delivered through Nature Business Line**
Strategic Outcome: *Help Canadians adapt to their environment in ways that safeguard their health and safety, optimize economic activity and enhance environmental quality*	**Strategic Outcome:** *Provide strategic and effective departmental management to achieve environmental results*
Key results: ▪ Reduced impact of weather and related hazards on health, safety and the economy. ▪ Adaptation to day-to-day and longer-term changes in atmospheric, hydrological and ice conditions. **Delivered through Weather and Environmental Predictions Business Line**	**Key results:** ▪ Strategic and integrated policy priorities and plans. ▪ A well-performing organization supported by efficient and innovative services. **Delivered through Management, Administration and Policy Business Line**

- A detailed description of Environment Canada's planning, reporting and accountability framework can be found at: www.ec.gc.ca/introec/dept_org.htm#mf

Business Lines are not isolated from each other. There are some common areas of interest across Business Lines, e.g., air quality, water, climate change and environmental effects, where staff from across Business Lines work co-operatively to achieve results.

Organizationally, the Department is divided into five headquarters services and five regions. Environment Canada's organizational structures cross-cut Business Lines in a matrix management approach. This allows for co-ordinated, consistent programming and direction, as well as client-centred delivery in a manner that respects regional differences.

Program delivery at Environment Canada is achieved by drawing on policy expertise, scientific and technical knowledge across the Department combined with a strong regional understanding of the social, cultural and economic factors that shape attitudes, perceptions and behaviour. Environment Canada's regional offices help inform and deliver the national vision for the environment at the local level. They work in partnership with provinces, territories, communities and others across the country and encourage partners to set goals sensitive to local and regional ecosystems. They provide science-based information, tools for action and opportunities for sharing experiences and learning. Moreover, they help build the capacity of all the players involved to effect changes that will improve quality of life.

Section 3: Strategic Context

3.1 Canada's Natural Environment - Challenges

Our natural environment has a tremendous capacity to absorb and filter the demands and outputs of human activity. It is renewable and highly resilient. But, as we know, when it becomes overloaded, the ecological economic, health and social impacts can be devastating.

There are clear signals that human activity globally is now substantially affecting the planet's absorptive and productive capacity. The results of these stresses include: compromised health as a result of environmental pollutants and hazards, loss of property and profitability due to shifting climate and weather patterns, and loss of biodiversity. Projected population and economic growth patterns will likely increase these pressures. Many of these issues are exceedingly complex and increasingly global in nature. Nowhere is this truer than in the case of climate change.

Putting the planet on a more sustainable footing represents one of the most important challenges facing humanity this century.

Environment and Health

A strong link exists between environmental pollution and health problems; especially for the elderly, children, and those with pre-existing health conditions. There is growing scientific acceptance that environmental quality is a major determinant of human health. Research indicates that there are no safe levels of exposure to particulate matter and ozone, two of the main "ingredients" of smog. Thousands of people die prematurely each year due to air pollution. The Walkerton and North Battleford water contamination incidents clearly demonstrate how the environment impacts on health.

Public concern about the environment continues to be motivated by the growing awareness of how environmental factors affect our health. Fully 61% of Canadians feel that their health is now affected a great deal (29%) or a fair amount (32%) by environmental problems. Most Canadians (88%) also feel that environmental problems will have either a great deal (59%) or a fair amount (29%) of an effect on the health of future generations; a view that has found stable support (87%) since tracking began in 1992 (Environics: Environmental Monitor, 2002–3).

Environment and Stewardship

Canada's ecosystems and wildlife are "legacy" issues for Canadians – a core part of the Canadian identity and an essential resource to be conserved for future generations. Canada's natural resources have significant economic implications – agriculture, forestry and fishing account for 13.6% of GDP and employ 2.3 million Canadians.

Canada has a key role to play as a global steward of the world's natural wealth: Canada is responsible for 20% of the world's wilderness, 24% of its wetlands, 9% of its fresh water, 10% of its forests, and the longest coastline in the world. Despite this richness, we are not immune to the pressures experienced across the globe — population growth, increasing

urbanization and unsustainable resource use. The threats are real: the loss of agricultural and natural lands, resource depletion, habitat loss and a decline in the quantity and quality of our water, to name just a few.

Canada has the responsibility to ensure the conservation of its vast landscape and the wealth of its natural resources for future generations. A clean and healthy environment is an essential element of a sustainable economy and of an enduring quality of life for Canadians.

The Challenge of Climate Change

Climate change is a shift in climate in response to any factor affecting the flow of energy through the Earth's atmosphere. Current interest is focused on the build-up of greenhouse gases (GHGs), which trap heat within the Earth's atmosphere. As a result, the Earth's surface has warmed and will continue to warm, in turn producing other climatic changes affecting rainfall, snow and ice cover, sea levels, and extreme weather events. Reducing GHG emissions will, in addition to ameliorating these changes, help clean the air, reduce acid rain, and repair the stratospheric ozone layer.

Canada is among the highest per capita emitters of GHGs in the world. Canada's total GHG emissions have been rising since the early 1980s, largely due to increases in emissions from transportation and energy use. The 20% increase in Canada's GHG emissions over the past decade outpaced growth in population (11%) and total domestic energy consumption (17%). However, Canada has improved its GHG intensity by 9.1%; that is, fewer GHG emissions are produced for every Gross Domestic Product (GDP) dollar.

Learning More about Environmental Concerns

For many years, Canadians have been clearly concerned about the environmental issues that affect their health and the health of ecosystems. They are increasingly seeking information on progress made towards managing issues such as air and water pollution, endangered species, the release of toxic substances, high impact weather and the use of Canada's natural resources.

Environmental indicators provide an effective means by which complex environmental data can be transformed into easy-to-use communication and decision-making tools — tools that can help us keep track of the state of the environment and measure progress towards sustainable development. Ideally, environmental indicators can be used in much the same way that economic indicators have been for many years.

Environment Canada is committed to regular reporting on environmental issues of importance to Canadians and has recently produced reports such as "Environmental Signals: Headline Indicators 2003" and its companion report "Environmental Signals: Canada's National Environmental Indicator Series 2003". Environment Canada's commitment extends to supporting the work of the National Round Table on the Environment and the Economy (NRTEE) to identify a core set of sustainable development indicators, and to work toward the development of a comprehensive

environmental information system for Canada as recommended by the Canadian Information System for the Environment (CISE) Task Force in October 2001.

- To learn more about environmental issues and protecting our environment, visit: www.ec.gc.ca/soer-ree

3.2 Responding to Environmental Challenges

The issues described above make it clear why we must take action to protect and adapt to our environment — for the health, security and economic prosperity of present and future generations of Canadians. As an agenda and mandated area of government, environment and sustainable development are relatively new areas compared with concerns such as health, education, the economy and labour. Key measures have been put in place to deal with the impacts of environmental neglect, but there is still too much emphasis on clean-up. We need to continue to work toward an environmental management system for Canada that will provide lasting solutions to address the root causes of environmental problems.

The 2002 Speech from the Throne placed strong emphasis on Canada's environmental agenda and reflected the need to integrate social, economic and environmental objectives. It recognized that our health and the health of our children, the quality of life in our communities and our continued economic prosperity depend on a healthy environment.

In response to the priorities set out in the Throne Speech of 2002, Environment Canada's agenda has been, and will continue to be focussed on the following critical areas over the next several years:

- **Reduce the Health and Safety Impacts of Environmental Threats**: focusing on concerns related to air, water, toxic substances, contaminated sites, high-impact weather and other hazards;
- **Sustain Our Natural Environment**: continue to shape and promote a natural legacy agenda, including implementation of the new *Species at Risk Act* (SARA); and
- **Move Forward on Climate Change**: implement Canada's Climate Change Plan.

Environment Canada is taking a long-term, innovative approach that enables the Department to address immediate problems, while at the same time ensuring a sustainable environment for future generations. Such an approach must include knowledge and innovation as a foundation of action, and domestic and international agendas operating in parallel. We must also continue to apply more horizontal management practices through partnerships with other government departments, provinces and territories, other countries and international organizations, and other key stakeholders.

- For the most current statement on departmental priorities, refer to EC's Report on Plans and Priorities 2003-2004, visit: www.ec.gc.ca/rpp/index_e.htm

3.3 Progress on Strategic Priorities

Year 2002-2003 - A Pivotal Time for Environment Canada

In overall terms, the federal government made significant progress in 2002-2003 on a number of key environmental issues:

- The Kyoto Protocol was ratified by the federal government;
- The *Species at Risk Act* (SARA) received Royal Assent;
- Amendments related to the *Canadian Environmental Assessment Act* (CEAA) to improve environmental assessment progressed; and
- Environment Canada completed reviews of how the *Canadian Environmental Protection Act, 1999* (CEPA 1999) has been implemented, and on approaches to modernizing Canada's weather services.

Budget 2003 provided an additional $3 billion for key environmental priorities, bringing so far, the total new funding for the environment, since 1997, to $5.3 billion for federal initiatives to 2007. Furthermore, it directed new infrastructure funding and existing industry and other programs to make climate change objectives a priority.

These are substantial accomplishments and are reflective of the continuing progress being made on key environmental issues. Highlights of progress made in 2002-2003 on all of the Department's stated priorities are described below, in this section of the report. Section 4 provides details of departmental performance in the context of the long-term strategic outcomes sought by Environment Canada's Business Lines. This year, in addition to noting significant achievements made by the Department in the period under review, emphasis has also been placed on presenting the cumulative progress Environment Canada is making relative to the goals to which long-term strategies are directed.

Priority # 1 - Reduce the Health and Safety Impacts of Environmental Threats

CLEAN AIR

Key Indicator: Levels of air pollutants

Trend: Mixed (some improving levels, but air quality problems continue in others)

Environment Canada continues to focus on the implementation of the federal government's Clean Air Agenda, which seeks to promote actions that reduce health risks and achieve physical improvements in air quality.

In terms of overall progress towards desired long-term results, Canada has realized great success in establishing an approach to transboundary air issues management, and in

developing the necessary federal regulatory framework around vehicles, engines and fuels. Of particular note in January 2003, Canada and the United States announced a commitment to build on transboundary air quality improvements of the last decade by starting work to develop new co-operative projects for the years ahead.

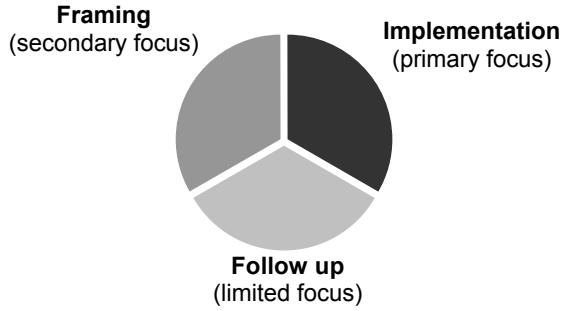
Continuing support has been given to provinces and territories in helping to meet international obligations reflected in Canada-wide standards and targets. The Clean Air Agenda is guided by the specification of clear targets and desired outcomes that largely require continuous improvement in air quality through to 2010. Current monitoring indicates that while there have been improvements in levels of some airborne pollutants, many parts of Canada continue to have air quality problems (i.e. ground level ozone, fine particulate matter, emissions of volatile organic compounds). Considering the substantial variation in air quality concerns across the country, national averages may not be the preferred mechanism for tracking the issue.

Environment Canada is also working with provinces, territories and municipalities to better inform Canadians about air quality conditions in their community. Air quality forecasts allow Canadians to make plans and take actions that reduce their personal health risk and reduce their contribution to air pollution. In the summer of 2002, smog forecasts were available to more than 60% of Canadians.

- Refer to Section 4.1.1 for further description of the management strategies and progress to date for this area
- For more information on clean air, visit: www.ec.gc.ca/air

Progress on Clean Air*

Primary focus is on the implementation of the Clean Air Agenda, particularly the enabling regulatory framework and public outreach. In terms of framing, the transboundary air issues management is well established but continuing work is proceeding with provinces and territories to develop sector-specific strategies.



* In this figure, broad indication is given of the stage of strategy implementation for departmental priority areas -- framing (policy development, research), implementation (program delivery, science solutions), or initiative renewal and follow-on.

WATER

Key Indicator: Water Quality Index (proposed)

Trend: To be established

Jurisdiction over water is shared and complex. The Canadian Council of Ministers of the Environment (CCME) is the forum for facilitating federal, provincial and territorial collaboration on environmental priorities of national concern. Through the CCME, Environment Canada is working with its provincial, territorial and "health" counterparts

with a focus on water quality, and water quantity and use. As well, efforts include developing environmental and drinking water quality guidelines based on sound science.

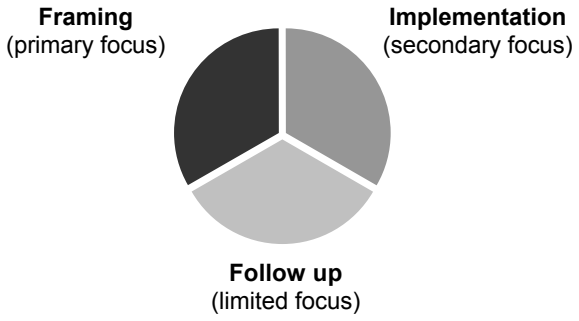
There has been significant progress in establishing a basis for shared governance with other levels of government and in collaborating on strategies and initiatives that will address the long-term goal of "clean, safe and secure water for Canadians and ecosystems through partnerships and expertise in integrated water resource management". This broader effort is complemented by work dealing with immediate issues, ongoing science and the discharge of legislated responsibilities.

During 2002, at the national level, Environment Canada, in collaboration with Health Canada, the Canadian Council of Ministers of the Environment (CCME) and the Committee on Environmental and Occupational Health (CEOH), contributed to the development of a comprehensive multi-barrier approach to improving drinking water protection. The "Source to Tap — Protecting Our Water Quality" section of the CCME Web site was launched in June 2002, and highlights how governments are working to strengthen the protection of water quality.

At the federal level, under the leadership of Environment Canada's National Water Research Institute (NWRI), a Federal Water Research Network was launched in 2002 to co-ordinate federal water science activities. In addition, federal science assessments have synthesized through collaborative effort, the science-related threats to water quality and water availability. The issues, critical questions and challenges facing researchers and governments in these areas were identified and served as a basis for setting priorities for the federal government and stimulating follow-up discussions through the CCME.

Progress on Water*

In addition to dealing with immediate issues at hand through science-related activities, progress has been made in developing frameworks for establishing a basis for shared governance with other levels of government and in collaborating with others to bring about long-term success.



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The Department provides a wide range of instruments and tools to assist other governments and Canadian citizens in managing all aspects of water (e.g., laws, regulations, water metering and pricing, guidelines, education, information and outreach activities). In 2002, Environment Canada and its partners successfully promoted the CCME Water Quality Index as the freshwater quality indicator chosen by the NRTEE in its Environment and Sustainable Development Indicators (ESDI) for Canada, which have been recommended to the Minister of Finance.

- Refer to Section 4.2.3 for further description of the management strategies and progress to date for this area

MANAGEMENT OF TOXIC SUBSTANCES

Key Indicator: On-site releases of selected toxic substances

Trend: Mixed (some improvements/declines)

Environment Canada's primary vehicle for reducing the level of contaminants in the environment is the *Canadian Environmental Protection Act, 1999* (CEPA 1999). The renewed CEPA adopts a proactive approach to prevent harm to the environment and human health caused by toxic substances.

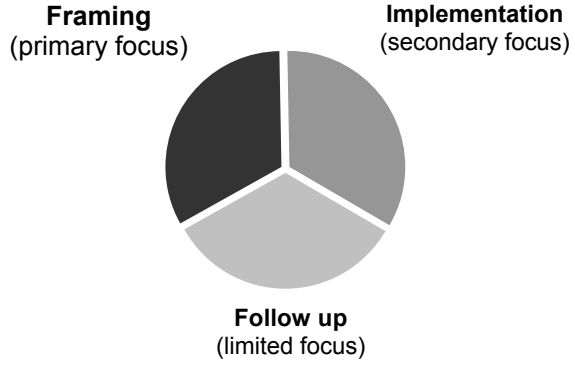
Since CEPA 1999 was proclaimed in 2000, the Department has focused on:

- Completing commitments under CEPA 1988;
- Assessing and managing the risk from over a thousand new substances proposed to be introduced into Canada each year;
- Developing strategies to meet the legislated timelines in CEPA 1999 to examine over 23,000 substances for the risks they pose to human health and the environment; and, develop preventive or control actions for those found to be toxic; and
- Completing pilot studies to streamline our assessment procedures to ensure that all CEPA requirements (e.g. categorization of Domestic Substances List (DSL) substances by 2006) will be met.

In terms of risk assessment responsibilities under CEPA 1999, the Department is on-track to meet the legislated requirement to have all 23,000 substances on the Domestic Substances List (DSL) categorized by 2006. By the end of the fiscal year, Environment Canada had published information available to the public on data for 12,000 organic chemicals. To support a more streamlined approach, the "Guidance for Categorizing Organic Substances on the Domestic Substances List" was made available in spring 2002. The introduction of Screening Assessments in CEPA 1999 has allowed for a more efficient and effective method to assess existing substances.

Progress on Toxic Substances*

Since CEPA 1999 was proclaimed emphasis has been on developing strategies to meet established timelines and completing pilot studies on assessment procedures. Near-term focus is on completing regulatory and non-regulatory frameworks over the next two to three years and shifting effort to compliance promotion and enforcement.



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Four substances were added to the List of Toxic Substances on Schedule 1 of CEPA 1999 (substances identified as toxic) bringing the total to 56. Another six substances were proposed for addition to the Schedule.

For the first time, Environment Canada used a new authority under CEPA 1999 to require the preparation and implementation of Pollution Prevention (P2) Plans. Environment Canada published notices to require Pollution Prevention (P2) Plans for Acrylonitrile and Dichloromethane. P2 Plans allow the Minister to establish environmental objectives and timelines; recognizes that industry is best situated to take action; and uses clear, results-based criteria to assess success. P2 Planning Notices addressing 3 substances were proposed for owners of selected municipal wastewater systems and will be finalized by December 2004. Notices were also proposed to require P2 Plans for toxic substances found in effluents from textile mills.

While these examples illustrate the use of a more flexible, non-regulatory risk management, the Department continues to manage a heavy regulatory agenda. In 2002-2003, four final regulations were published in the Canada Gazette (CG) Part II and three were proposed in the Canada Gazette Part I.

The Department conducts a number of compliance promotion activities to help those subject to CEPA 1999 understand and achieve compliance with environmental laws. Activities included the provision of information and education through workshops and seminars, and through the development and distribution of material such as brochures, fact sheets and information packages. Enforcement activities include inspection by site visit or by review of submitted reports as a means of verifying compliance. In cases of non-compliance, enforcement officers will investigate. If a violation is confirmed, action will be taken using one or more of the enforcement tools available. The Department is putting more resources into compliance promotion, compliance monitoring, compliance verification and compliance enforcement. This includes developing new tools and enhancing programs that will help the Department better target the regulated community.

The Speech from the Throne called for the establishment of an External Advisory Committee on Smart Regulations which will provide an external perspective and expert advice on regulatory issues spanning economic and social policy objectives. To support the work of the Committee, Environment Canada developed the following key documents:

- Improving Environmental Regulation: An Environment Canada Perspectives Paper, May 23, 2003, EC Working Paper; and
- Compendium for Improving Environmental Regulation: An Environment Canada Perspectives Paper, May 23, 2003, EC Working Paper.

- Refer to Section 4.1.2 for further description of the management strategies and progress to date for this area

- For more information on toxics, visit: www.ec.gc.ca/pollution_e.html

HIGH-IMPACT WEATHER AND RELATED HAZARDS

Key Indicator: Weather-related disasters in Canada (estimated losses)

Trend: Deteriorating (estimated losses are increasing)

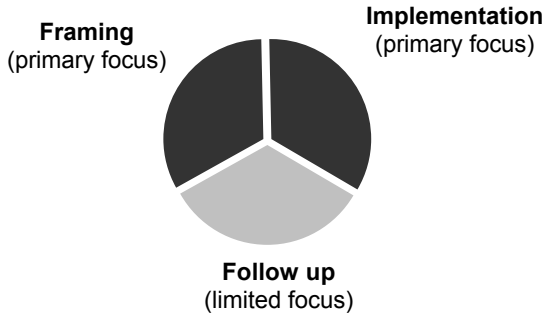
One of the Department's key goals is to reduce Canadians' risk from weather-related environmental hazards. The Meteorological Service of Canada (MSC) is the country's primary source of weather warnings. This mission has been further characterized in recent Weather and Environmental Prediction (WEP) business plans to provide a focus on high-impact events (including severe weather and air quality) as the top priority.

As a recently emerging top priority, the Department is taking a comprehensive approach to decreasing vulnerability to severe weather and environmental hazards, by developing strategies in four areas — science, policy, outreach and services. This framing effort is supported by the ongoing delivery of services in a number of areas including: emergency response, operation of the Canadian Hurricane Centre, air quality forecasts, severe weather preparedness education and awareness activities, wind chill index and technical support to weather-sensitive industries.

In 2002, cumulative progress towards long-term results was most noticeable in the air quality area. In recent years, MSC has taken significant steps in enhancing science modelling technology and partnerships that support the provision of advice to policy makers in reducing air pollution, and for forecasting air quality. The National Air Quality Prediction Program provides numerical/chemical model guidance to provincial agencies and Environment Canada regions that produce daily air quality forecasts for the public. New and expanded smog forecast programs were introduced in Newfoundland and Quebec.

Progress on High-Impact Weather and Related Hazards*

The Meteorological Services of Canada has a proud tradition of delivering quality products and services to Canadians every day, every hour. In addition to the focus on maintaining a world class level of performance in service delivery, science, monitoring and production functions, the MSC has recently devoted considerable attention to establishing a new vision for the future and the modernization efforts that are required to maintain a sustainable weather service over the long term.



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In 2002, a notable accomplishment in severe weather outreach activities was the development of a single graphical public weather warning display for across Canada. The Weather Warning Battleboard allows users to determine, from one website, official MSC weather warning

status throughout Canada in both official languages. As part of the effort in severe weather activities in 2002, MSC provided specialized services to help manage forest fires in the James Bay area.

- Refer to Section 4.3.1 for further description of the management strategies and progress to date for this area
- For more information on weather, visit: www.weatheroffice.ec.gc.ca

Priority # 2 – Sustain Our Natural Environment

BROADER CONSERVATION AGENDA

Key Indicator: Biodiversity Index (proposed)

Trend: To be established

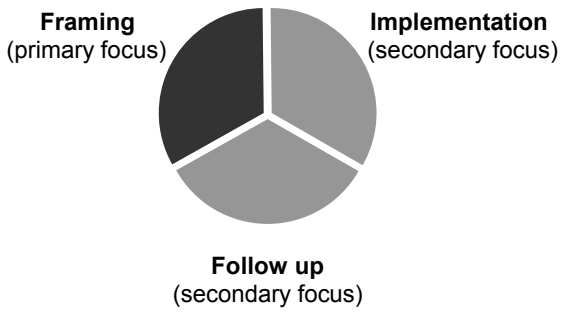
Ecosystems are a way of describing a particular geographic area that highlights the inter-related nature of all its parts. Today, the Department is actively involved in three areas of broad ecosystems work:

- Working with provincial and territorial partners on: the Canadian Biodversity Strategy; and with Resource Ministers on developing integrated approaches;
- Implementing a Natural Legacy Agenda for the federal level focusing on: wild living resources; stewardship of public and private lands; protected areas and science; and
- Using Ecosystem Initiatives to establish government-community partnerships to address environmental and sustainability issues.

At their 2002 joint meeting, Forest, Wildlife, Fisheries and Aquaculture Ministers agreed to advance four priority areas under the Canadian Biodiversity Strategy through their collective actions. Significant accomplishments in developing integrated, collaborative approaches included: approval and release of Canada's Stewardship Agenda; approval of a blueprint for a national plan on invasive alien species; approval of a plan to develop a Canadian Biodiversity

Progress on Broader Conservation Agenda*

Goals related to landscape conservation have been formulated and agreed to by federal, provincial and territorial "natural resource" Ministers. Activities conducted in all Ecosystem Initiatives have achieved environmental results through partnerships, science and information sharing. On the ground results are also being achieved through the Habitat Stewardship Program and the Protected Areas strategies. Emphasis in the near-term is to move towards comprehensive delivery against goals. All Ecosystem Initiatives are under consideration for renewal and follow-up.



* In this figure, broad indication is given of the stage of strategy implementation for departmental priority areas -- framing (policy development, scientific research), implementation (program delivery, science solutions), or initiative renewal and follow-on.

Index and web portal; and agreement on biological information management guiding principles and agreement to develop a biodiversity science agenda and a co-ordinating mechanism for biological information management.

For protected areas, the Speech from the Throne announced the commitment to establish ten new parks and five new marine conservation areas, and implement a plan to restore the ecological health of existing parks.

In addition to the development of enduring frameworks and commitments for action, activities conducted in all Ecosystem Initiatives during 2002-2003 helped Canadians achieve environmental results through partnerships, pooling resources, focusing science, and sharing information.

In Section 4 of this report we have featured the accomplishments derived from the Georgia Basin Ecosystem Initiative. Reference should also be made to the description of regional office initiatives noted below in this section of the report

- Refer to Section 4.2.1 for further description of the management strategies and progress to date for this area
- For more information on ecosystems, visit: www.ec.gc.ca/ecos_e.html

SPECIES STRATEGIES

Key Indicator: Status of reassessed species

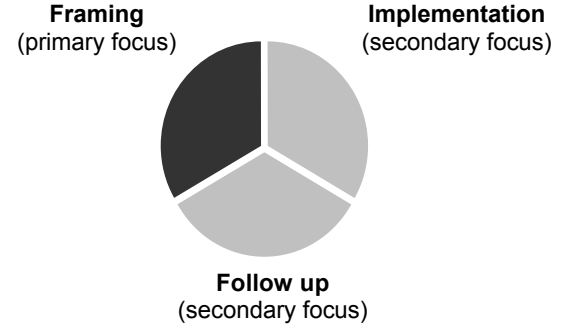
Trend: Deteriorating

On December 12, 2002, the *Species at Risk Act* (SARA) received Royal Assent bringing to close a nine-year legislative process to enact federal legislation for the protection of Canada's species at risk and their critical habitat. Passage of the Act fulfils a major part of the federal government's commitment to protect these species and their habitats, and also fulfils a key international obligation under the international Convention on Biological Diversity.

SARA and related provincial and territorial activities under the Accord for the Protection of Species at Risk present Canadians with a tremendous opportunity to renew our approach to wildlife conservation, to protect and

Progress on Species Strategies*

The emergence of species at risk legislation across Canada in the 1990s, culminating in the Royal Assent of the federal *Species at Risk Act* (SARA) in December 2002, has established a comprehensive framework for the protection and recovery of species at risk in Canada. Near-term effort is focused on implementing SARA and in finalizing a new migratory bird plan.



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conserve habitat and to secure new resources to devote to the full range of conservation programming, from science through to operational programs. The Act establishes an arms length scientific species assessment process, a national legal listing process, and national prohibitions on killing or harming listed species or their habitat. The Act also requires the development of species recovery plans and related critical habitat protection measures. These new, legally-binding provisions, in combination with a wide range of existing species and habitat programs and strategies put Canada in a position to reshape its approach to natural resource development, land use planning and conservation.

Despite these programs and strategies, Canada, in many instances, is not winning the battle to maintain and restore wildlife and habitat. A recent assessment of the status of selected species by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) points to the long-term challenges in protecting species at risk. To monitor progress COSEWIC reassesses the status of select species to determine trends. A recent reassessment showed improvement in the status of 20% of the 170 species reassessed, compared to the base year of 1985, and no change or a decline in status in the majority of cases. In parallel with the species at risk assessments, recent study of migratory bird populations also shows disturbing trends: approximately 35% of landbird species, and almost one half of the 56 shorebird species, are in decline.

There is a growing sense of urgency to address these trends. As the federal government now proceeds to implement SARA and new migratory bird strategies, there is an opportunity to reconsider the way in which conservation programs are designed and delivered. In addition, greater emphasis will be placed on monitoring and enforcement (activities that have been lacking in the past).

- Refer to Section 4.2.1 for further description of the management strategies and progress to date for this area
- For more information on species at risk, visit: www.speciesatrisk.gc.ca

Priority # 3 – Move Forward on Climate Change

CLIMATE CHANGE

Key Indicator: Greenhouse Gas Emissions

Trend: Deteriorating

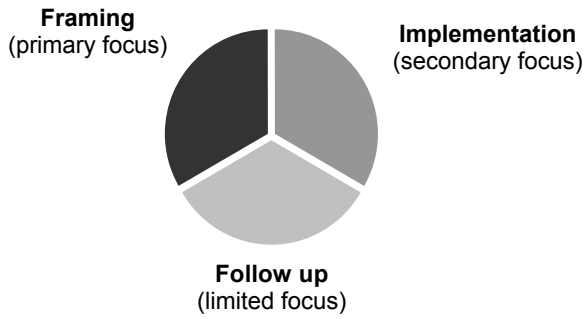
The major accomplishment of the climate change agenda in 2002-2003 was the December 17, 2002 deposition of Canada's Instrument of Ratification for the Kyoto Protocol following votes in the House of Commons and the Senate. Ratification commits Canada to reduce its greenhouse gas emissions to 6% below 1990 levels by 2012. The decision followed extensive consultations with other levels of government, industry and Canadians on draft policy options and plans prepared by the federal government, with Environment Canada playing a key role.

Central to the ratification decision was the Department's vital role in helping to shape the Climate Change Plan for Canada which sets out the "blueprint" for action in achieving the country's climate change goal.

Over the past ten years, the federal government has moved the climate change agenda from one of defining the issue to implementing a plan to meet our international commitment. In addition to helping establish the Climate Change Plan for Canada, Environment Canada's policy work, scientific research, public outreach and participation in national and international fora have contributed to other broad achievements, which positions the country to having a clear framework for action in every sector of the economy:

Progress on Climate Change*

To-date strategies have focused on framing international rules and a domestic plan of action. Some major programs are being implemented that are focused on early action. Near-term emphasis will be to move from framing to implementation.



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- Environment Canada has played an instrumental role in establishing international agreements that shape the general rules and technical frameworks for the implementation of the Kyoto Protocol; and
- In partnership with Natural Resources Canada and other government departments, Environment Canada has been building capacity to meet climate change commitments through programs, such as Action Plan 2000 and the Climate Change Action Fund, that support climate change science, technology development, impacts and adaptation research, and public education and outreach.

Environment Canada's next steps are guided by the Climate Change Plan for Canada. The Government of Canada will report to Canadians every two years on the effectiveness of the Plan with the first report to be released in 2005.

- Refer to Section 4.1.1 for further description of the management strategies and progress to date for this area

- For more information on climate change, visit: www.ec.gc.ca/climate

3.4 Progress on Horizontal Management Priorities

SUSTAINABLE DEVELOPMENT

In accordance with Treasury Board guidelines, this Departmental Performance Report (DPR) provides performance information that provides Parliament with an overview of the implementation of Environment Canada's Sustainable Development Strategy (SDS),

including reference to our efforts related to the Sustainable Development in Government Operations initiative.

- Refer to Annex A.1 – "Sustainable Development Strategy"

PURSUIT OF EXCELLENCE IN SCIENCE AT ENVIRONMENT CANADA

Science and Technology (S&T) activities account for approximately 70% of departmental spending. These efforts create the knowledge and tools needed to deliver the Department's mandate to help Canadians live and prosper in an environment that needs to be protected, respected, and conserved. S&T enables us to better understand cause-and-effect relationships, to ensure early identification of emerging issues and to find the most effective and efficient solutions to environmental challenges. Environment Canada's S&T activities support the Department's ability to develop and implement policy, deliver important services to Canadians and develop new technologies for environmental purposes.

The Department promotes excellence in its S&T through a clear and effective management system. It consists of the external S&T Advisory Board to the Deputy Minister, a Special Science Advisor, as well as several internal S&T management committees. Environment Canada also takes direction on the evaluation of the management and performance of its S&T programs from the principles of the Federal Science and Technology Strategy developed in 1996 and from the Council of Science and Technology Advisors, which provides expert advice on internal federal government S&T. These elements of the management system serve as the mechanism by which the Department contributes to and implements federal S&T policies and management practices.

In addition to performing S&T, Environment Canada works to catalyze partnerships and networks for environmental S&T. These are critical to the Department's ability to deliver S&T and make effective use of their outputs. Such collaborative arrangements also help to resolve environmental issues - for example, through consensus-building on "state of science" assessments.

Key S&T Accomplishments

Science Contributions

Key science contributions to the business lines during the planning period are reported in Section 4 under the individual business lines.

Ensuring Ongoing S&T Excellence

Environment Canada has taken many important steps to ensure the ongoing excellence of its S&T. Specific accomplishments include the following:

- The Departmental S&T Advisory Board provided recommendations on a research strategy for the ecosystem effects of genetically modified organisms. These will assist the Department in planning for the knowledge it needs in this important area.
- A web-based directory of expertise in the Department, EC XPERT, was developed. It will help the Department to better manage its knowledge.

- The implementation measures of the Federal Science Advice Framework were met. These will assist in strengthening the Department's science-policy links.
- The Department was strongly involved in the successful Federal S&T Forum — in its planning, in the event and in follow-up. Important outputs of the Forum were a Vision for Federal S&T and actions to better integrate federal S&T.

Atlantic Environmental Science Network

At a two-day workshop in May 2001, some 60 key decision-makers from academia, governments and industry endorsed an Atlantic Environmental Science Network (AESN) strengthening environmental science presence in the east. Over the next several years, collaborative science endeavours will be developed in 6 priority thematics - Biodiversity, Watersheds, Climate Change, Environment and Human Health, Environmental Engineering, and Marine Life. In 2002-2003, key partners from 12 Atlantic universities, Atlantic provincial governments and environmental industries, federal departments and NGOs initiated the science network in Environment and Human Health, and Climate Change thematic areas. This network is now preparing specific project proposals under these themes for submission to granting councils.

- To learn more about Environment Canada's S&T, visit: www.ec.gc.ca/scitech/index_e.htm

INTEGRATED REGIONAL DELIVERY OF PROGRAMS AND SERVICES

Environment Canada is divided organizationally into five headquarters services, led by Assistant Deputy Ministers, and five regions, led by Regional Directors General. The organizational leads are accountable for the delivery of results as set out in Business Line plans and for management of their organizations. Environment Canada's regional offices have integrated the delivery of their programs across Service lines to enhance the "ecosystem approach" to environmental challenges, and to provide a single window to the provinces, partners and citizens.

The environmental and sustainability challenges facing the federal government vary considerably across the country in the different regions. A strong, integrated regional presence allows for an approach to priority setting, and program and service delivery that is responsive to unique local challenges and conditions.

The benefits of this approach are most strongly felt, however, in the success the Department has had in establishing relationships with regional stakeholders, both formal and informal, that allow Environment Canada through its partnerships, to better deliver its environmental mandate within a larger sustainability context. The Department's ecosystem approach, which involves all regional offices, deliberately engages provincial governments and other pertinent agencies in partnership arrangements to address the inter-jurisdictional nature of policy and scientific issues impacting specific ecological systems. Recently, the ecosystem approach is being transformed to a broader sustainability focus that reflects the development of more integrated goals and outcomes, and a broadening of strategic alliances to better recognize the inter-relationship of environmental, social and economic perspectives and actions.

Throughout this document reference has been made to specific contributions regional offices have provided in translating national policies, priorities and goals into concrete actions at the local level. These specific accomplishments need to be set in the context of

the broader successes the regional offices have made in transforming local governance relationships that mobilize partnerships for action. Some examples include the following initiatives:

- In the Pacific and Yukon Region, the Georgia Basin Ecosystem Initiative (GBEI) has focused on a shared vision of "achieving healthy, productive and sustainable ecosystems and communities". The GBEI evolved into a partnership with the provincial government in British Columbia, other federal partners, a trans-boundary agreement with the U.S. Environmental Protection Agency, a co-operation agreement with provincial municipalities and other agreements with First Nations groups. A name change, from an Ecosystem Initiative, to an Action Plan, reflects the transformation of focus from a narrow environmental perspective to taking action on comprehensive concerns about sustainability issues in the Georgia Basin.
- In the Prairies and Northern Region, a cross-cutting challenge is to respond to the pace and scope of industrial development. The oil sands investments in Northern Alberta and huge pressures for infrastructure development to open up the North are but two examples of the huge demands placed on the Department to participate in environmental assessment processes associated with managing these developments. The Region's strategy involves working with local stakeholders on regional frameworks to assess and manage multiple projects; coordinating science, regulatory and community interests; and implementing an adaptive management approach. The regional office must demonstrate leadership to bring science, policy-makers and decision-makers together to collectively manage issues, and to do it publicly. The Department at the regional level uses the environmental assessment process as a strategic tool to bring science to bear at the front-end of development where it will have the most beneficial impact.
- In the Ontario Region, engagement of key stakeholders, particularly as it relates to issues associated with the Great Lakes Basin, is a primary concern underlying regional strategies and approaches. The Region uses a number of mechanisms, including key agreements such as the Canada-Ontario Agreement (COA) and the Great Lakes Water Quality Agreement (GLWQA), to engage partners at the international, federal, provincial, and municipal levels. The GLWQA will be open for review in 2005 and represents an opportunity for Canada to re-engage with the United States a sense of shared goals for this important ecosystem based on current science. Through the COA, the Ontario Region has been engaging municipalities on areas of concern and knowledge sharing through indicators work, regional outreach on climate adaptation, and habitat conservation issues.
- In the Quebec Region, the St. Lawrence Action Plan, first launched in 1988, is one of the largest environmental initiatives for the protection and conservation of Canada's major ecosystems. Its approach established objectives in the form of concrete, measurable results that has served as a model for similar initiatives across the country. By setting up this project, the Canadian and Quebec governments have shown that they can join forces to co-ordinate their respective activities on the St. Lawrence and thereby obtain better results. These collaborative activities, in which the private sector, universities, research centres, non-governmental organizations and riverside communities also participate, have produced excellent results while providing major economic and scientific spin-offs. Fifteen years later, the St. Lawrence is in better shape, and measurable progress and results have been achieved in several major areas,

including the reduction of toxic substances, the maintenance of biodiversity, community involvement, the protection of human health and agricultural clean-up.

- In the Atlantic Region, The Atlantic Coastal Action Program (ACAP) is a community-based program that relies on local involvement and support. ACAP involves 14 sites across Atlantic Canada — two in Newfoundland, two in Prince Edward Island, five in Nova Scotia, and five in New Brunswick. Each site has formed an incorporated, non-profit organization with its own Board of Directors, and each site maintains a full-time paid co-ordinator and an office. While Environment Canada contributes to project funding, community stakeholders contribute most of the resources through volunteer labor, in-kind contributions, and financial support. ACAP helps communities to define common objectives for environmentally appropriate use of their resources and to develop plans and strategies that will help achieve them.
- The community-based ACAP approach illustrates the tradition in the regional office of working with others to deal with environmental issues. This philosophy has been applied to much of what the Atlantic Region does, including: support to the establishment of the Joint Action Committee for the environmental clean-up of Sydney Tar Ponds; the establishment of the Atlantic Environmental Research Network to coordinate research and build a stronger science capacity for environmental issues; and the more recently established co-operative arrangements through federal councils to promote collaborative activities that contribute to sustainable development.

- To learn more about Environment Canada's regional activities, visit the following Web sites: www.ec.gc.ca/regeng.html

APPLYING KNOWLEDGE TO BETTER SERVE CANADIANS

In 2002, the Department launched a new initiative to strengthen service delivery to Canadians through deliberate integration of our people, service, outreach, and knowledge agendas. At its core, this initiative is about: providing services to Canadians; being recognized as an effective player in the generation, acquisition and dissemination of knowledge in Canada; and creating a workplace that attracts, nurtures and retains the best talent. Specific accomplishments include: establishment of a new organization (Human Resources and Service Innovation) to integrate the leadership for the four components of this initiative in one Service; development of strategic frameworks for each of the four components; and launch of a series of demonstration projects to test the approach.

GOVERNMENT ON-LINE AND SERVICE IMPROVEMENT

In 2002-2003, Environment Canada continued to move towards meeting the commitment to provide seamless access to environmental information services for a full range of clients and partners, including the Canadian public, businesses, other government departments, other levels of government and communities of interest.

- The Department's main accomplishments have been outlined in the various sections of this report as well as in the Environment Canada On-Line Report available at: www.ecg.c.ca/egov-cgouv/egov-report.html

Concentration this year was in the following areas:

- Changing how we work — through improved service delivery;
- Increased collaboration with partners — as demonstrated through the Sustaining the Environment and Resources Cluster on the Canada site;
- Engaging Canadians through technology — as demonstrated through our watch programs under NatureWatch as Frogwatch, IceWatch, PlantWatch and Wormwatch; and
- Government On-Line — as demonstrated through the substantial work undertaken in redesign and revitalization of Environment Canada's Web site.

- For more information on the Sustaining the Environment and Resources Cluster, visit: www.environmentandresources.gc.ca
- For more information on NatureWatch programs, visit: www.naturewatch.ca
- For more information on Government On-Line, visit: www.ec.gc.ca

The Department is progressing well on the Service Improvement Initiative, which seeks to achieve a 10% improvement in the quality of current key services by the year 2005. At present, three key services are part of this initiative:

- Precipitation elements in forecasts;
- Severe weather warnings; and
- Toxic import and export permits.

For these services, the Department is developing benchmarks (through the use of surveys), standards and service improvement plans to establish the basis for achieving improvement in the quality of services. The improvement plans were implemented in fall 2002. For example, initiatives included such things as revising product standards, new scientific performance measurement technologies and new Internet based service delivery technologies for the public and media. Service delivery against established standards will be measured each year to assess the progress towards the attainment of the 10% improvement target. Future Departmental Performance Reports will demonstrate performance against established targets. In the fall of 2004, based on the results of this pilot project, Environment Canada will be assessing the possibility of expanding the Service Improvement Initiative to other services.

IMPLEMENTING MODERN MANAGEMENT

Environment Canada's Modern Management Action Plan (MMAP) is focused on ensuring sound management of public resources and effective decision-making through better performance information, appropriate risk management and control systems, reinforcing values and improved accountability of government to Parliament and citizens.

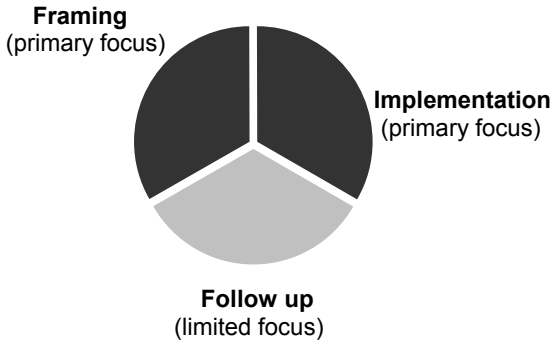
The 2002–2003 year marks the first year of implementation of EC's MMAP. To-date, MMAP has already drawn a strong commitment from the fifteen multi-disciplinary teams created to work on the 38 MMAP initiatives scheduled in 2002-2003. Overall, implementation progress is on schedule. One of Environment Canada's initial objectives of addressing gaps to reach a level of comptrollership equivalent to the Control Level of

the Auditor General Financial Management Capability Model is about to be achieved with progress accomplished so far, including the implementation of an enhanced coding structure, the deployment of an internal control framework, and progress achieved with data management, planning and budgeting processes.

- Refer to Section 4.4.2 for further description of the challenges, management strategies and commitments for this area.

Progress on Implementing Modern Management*

The 2002-2003 year marks the first year of implementation of Environment Canada's Modern Management Action Plan (MMAP). The MMAP will ensure that the Department has the management capacity to deliver its policy and program initiatives and contribute to the achievement of the KISC agenda. In addition, the Department has turned its attention to a broader strategy to manage and share knowledge creatively, and encourage innovation to better serve Canadians. Refining and implementation of the Knowledge in the Service of Canadians Agenda will be a continuing priority of the Department over the near term.



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Section 4: Departmental Performance by Strategic Outcome

PRINCIPLES-BASED APPROACH

This section provides performance information related to the progress Environment Canada is making in achieving established long-term key results. We have considered the following principles in guiding our reporting:

- *Focus on outcomes:* Section 4 is structured around the four strategic outcomes and nine long-term key results of Environment Canada's Management Framework.
- *Set performance in context:* We have integrated into the performance reports for each priority area, relevant outcomes data where available. Typically, we have drawn upon published state of the environment data. The text also provides a brief summary of the long-term strategies being pursued by the Department to address societal needs or issues, and links the approach to broader government-wide priorities.
- *Show progress towards long-term results:* An effort has been made to report on the cumulative progress being made by the Department in achieving long-term results and targets, as well as an identification of the specific accomplishments in the specific year (2002-2003) under review.
- *Link resources to outcomes:* Financial information is provided that allows readers to determine the level and nature of investments made in the four departmental strategic outcomes.
- *Identify sources of information:* This report identifies the source of outcome and performance data where appropriate to enhance reader confidence in the credibility and reliability of the information presented.
- *Associate performance with earlier comments:* The accomplishments noted in the performance narratives that follow, relate directly to the commitments made in the Department's Report on Plans and Priorities 2002-2003. A line-by-line reporting of performance by commitment can be accessed through reference to the link that follows.

Detailed Accounting: Accomplishments relative to the Report on Plans and Priorities Commitments

- Note: To obtain detailed information on accomplishments relative to the individual performance commitments set out in the Department's RPP 2002-2003, visit: www.ec.gc.ca/rpp

4.1 Clean Environment

Strategic Outcome: Protect Canadians and their environment from domestic and global sources of pollution

Canadians are affected by pollutants from many sources and in many different forms. Thousands of Canadians die prematurely each year from air pollution. Toxic chemicals are accumulating in lakes, rivers, wildlife and the North, and greenhouse gas emissions alter the climate. Experience has shown that the costs of cleaning up past contamination are much greater than preventing pollution in the first place.

Through the Clean Environment Business Line emphasizing a preventive approach, Environment Canada acts on two fronts to protect Canadians and their environment from domestic and global sources of pollution. First, it seeks to reduce the impact of human activity on the atmosphere and air quality. Second, the Department works to prevent or reduce the threats posed by toxic or other harmful substances in the environment.

Within Environment Canada's Management Framework, the Clean Environment strategic outcome is supported by two key results. Consistent with the structure provided in the Departmental Report on Plans and Priorities, we have grouped departmental priority concerns under the key results to which they relate. This logic structure is shown in the table and the narrative performance comments that follow.

STRATEGIC OUTCOME AREA: CLEAN ENVIRONMENT		
Key Results:		
Atmosphere & Air Quality		**Toxics**
Priority Areas Reported On:		
Climate Change	**Air Quality**	**Toxic Substances**

Clean Environment Business Line

Protect Canadians and their environment from domestic and global sources of pollution

Environment Canada, through the Clean Environment Business Line, aims to achieve two key results:

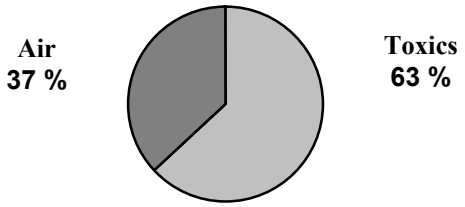
- Reduced adverse human impact on the atmosphere and on air quality; and
- Understanding and prevention or reduction of the environmental and human health threats posed by toxic substances and other substances of concern.

Spending by Key Result ($millions)

(including respendable revenue)

Reduced adverse human impact on the atmosphere and on air quality.	$ 123.5 *$ 108.7* **$ 87.1**
Understanding and prevention or reduction of the environmental and human health threats posed by toxic substances and other substances of concern.	$ 130.7 *$ 163.1* **$ 148.4**
Total for the Business Line Planned Spending *Total Authorities* **Actual Spending**	 $ 254.2 *$ 271.8* **$ 235.5**

Actual Spending



Key Partners

An extensive list of partners from all sectors of society by program area can be found in EC's Report on Plans and Priorities 2003-2004 (www.ec.gc.ca/rpp/2003/en/a7a.htm#anchor71). Partners relevant to the initiatives reported on in this period have been included in the narrative of this report.

Key Targets and Overall Results

Overall key indicators (as per Section 3 of this report) – levels of air pollutants; greenhouse gas emissions; and on-site releases of selected toxic substances (proposed); for detailed targets under consideration see EC's Report on Plans and Priorities 2003-2004 (see www.ec.gc.ca/rpp/2003/en/a3a.htm#anchor31)

Overall results sought as stated above.

Program, Resources and Results Linkages

CEPA – expenditures 2002-2003 - $ 177.6M

Climate Change - expenditures 2002-2003 - $36M (expenditures from all Business Lines - Climate Change Action Fund; Action Plan 2000)

Management Practices

CEPA Operational Review and ongoing contributions to the horizontal management initiatives of the Department (reported in the Management, Administration and Policy Business Line template).

4.1.1 Key Result: Atmosphere and Air Quality

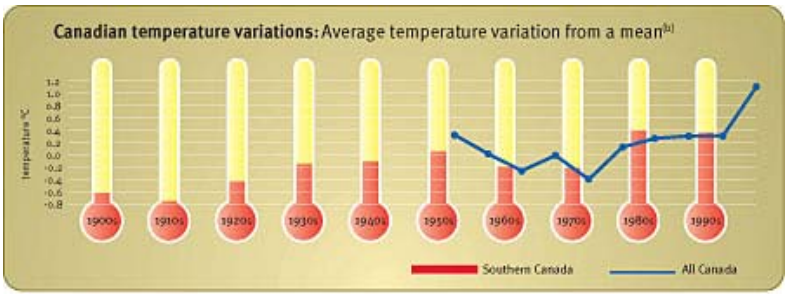
Reduced adverse human impact on the atmosphere and on air quality

CLIMATE CHANGE

What is the issue?

Greenhouse gases (GHGs) trap heat within the earth's atmosphere, and make the earth habitable; however, changing the concentrations of these greenhouse gases changes our climate. Scientific research shows that an increase in GHGs from human activities (mostly from burning of fossil fuels like gasoline and coal), combined with deforestation, is changing the balance of the world's atmosphere. As a result, the earth's average temperature is getting warmer. Globally, this will have an impact on the quality of life of billions of people and may have devastating impacts on northern and energy exporting countries like Canada. In Canada, climate change will affect fishing, farming, forestry, lakes, rivers, coastal communities and the North. While Canada creates only two percent of the world's GHGs, it does so with approximately 0.5 percent of the world's population.

- For a more detailed description of climate change, please visit: www.ec.gc.ca/climate



What are we doing about it?

Addressing climate change has been a priority for Environment Canada since 1990 and climate-related science began in the mid-70s. The Department's policy and program strategies have focused on:

- Contributing to the development of international frameworks and marketplace rules that will provide the basis for a global response to climate change;

Environment Canada's climate change priority is to work with federal departments and other stakeholders to continue to advance our climate change agenda such that we meet our Kyoto commitment – to reduce GHG emissions to 6% below 1990 levels (a 240 megatonne / year reduction from the business-as-usual projections) by 2012.

- Laying the foundation for Canada's participation in the Kyoto Protocol through extensive consultations with industry, NGOs, scientists, all levels of government and Canadians;
- Taking action through Action Plan 2000, the Climate Change Action Fund and other initiatives to better understand the science, measurement and opportunities for reduction of GHG emissions; and
- Raising the awareness and understanding of climate change among Canadians.

As the federal lead on climate change science, Environment Canada undertakes and supports a broad range of scientific research in climate modeling and impact assessment, including initiatives of the Canadian Centre for Climate Modeling and Analysis and participation in the work of the Inter-governmental Panel on Climate Change. In 2000, the federal government allocated $60 million over six years to the Canadian Foundation for Climate and Atmospheric Sciences to support academic research on climate change and air quality. The Climate Science Agenda for Canada 2002-2012 sets out a co-ordinated approach to climate research among federal government departments, universities and others.

- For more information, visit: www.msc-smc.ec.gc.ca/saib

What have we accomplished?

Cumulative performance

Over the past ten years, Environment Canada has moved the climate change agenda from one of defining the issue to implementing a plan to meet our international commitment. The Department's policy work, scientific research, public outreach efforts, and participation in national and international fora contributed to:

- The international rules framework and marketplace mechanisms necessary for the implementation of GHG reduction strategies;
- Broad engagement on climate change, both nationally and internationally; and
- The Climate Change Plan for Canada that fairly shares the responsibility for emission reductions among all governments (federal, provincial, territorial and municipal), all sectors and consumers.

Climate Change Plan for Canada

The Climate Change Plan for Canada provides a clear framework for action in every sector of the economy. The Plan sets a national goal — for Canadians to become the most sophisticated and efficient consumers and producers of energy in the world and leaders in the development of new, cleaner technologies.

International rules and frameworks:
Environment Canada has played an instrumental role in the international agreements reached to-date. Canada's negotiations in Bonn (July 2001) helped shape the general rules for the implementation of the Kyoto Protocol and ensured that mechanisms important for Canada's climate change response (e.g., workable rules for international mechanisms, "sinks") were included. At the Conference of the Parties

(CoP) 7 meeting in Marrakech, Morocco (November 2001) the international community passed a major milestone with the acceptance of a climate change implementation framework. Canadian-led consultations prior to Marrakech are credited in large part with addressing the uncertainty of developing countries with the use of the Clean Development Mechanism (CDM) and its inclusion in the framework. Canada also made important advances on technical issues that helped to finalize the legal text and details of the Marrakech Accord at CoP 8 in New Delhi (December 2002). Environment Canada continues to work with international partners to resolve remaining technical details, as well as negotiate recognition for clean energy exports.

Canadian climate change capacity: In partnership with NRCan and other government departments, Environment Canada has been building the Canadian capacity to meet climate change commitments through programs that support climate change science, technology development, impacts and adaptation research, and public education and outreach. Two important programs are:

Action Plan 2000 (AP2000), a five-year, $500 million plan that lays the groundwork for long-term behavioural, technological and economic changes. Implementation of the 45 AP2000 measures, targeted at key sectors such as transportation, energy technology, commercial and residential buildings, forestry and agriculture, will reduce greenhouse gases by about 65 megatonnes each year; and The Climate Change Action Fund (CCAF), $150 million program to support the development of a national implementation strategy and early actions to respond to climate change. The first phase was established in the 1998 Federal Budget and its success led to program renewal and Phase II (also $150 million over three years). Phase II is now under way and has a focus on international policy, technology development, science, impacts and adaptation, and public education and outreach (PEO). As in Phase I, Environment Canada leads the climate change science and public education and outreach activities.

Forecast GHG Reductions from On-going and Planned Initiatives

Actions by Canadians and Governments:	
Transportation and Buildings	28-33 Mt
Large Industrial Emitters	80 Mt
Other Industrial Emissions:	
Technology, Infrastructure and Efficiency Gains	16 Mt
Agriculture, Forestry and Landfills/ Sinks and Offsets	38 Mt
International Market	12 Mt

Note: Balance (60 Mt) of Canada's 240 Mt GHG emissions reduction target will be addressed through future programs.

Bilateral relationships: Soon the aggregate emissions of developing countries (who do not have legally binding reduction targets in the first commitment period) will exceed those of countries with climate change targets. Environment Canada is pursuing strategic, bilateral relationships with those countries that will be significant in the second commitment period (2012-2016) due to either their potential for emission reductions or emission credits. The Department has recently signed MOUs with Brazil, Mexico, Russia and China. These agreements position Environment Canada, in partnership with DFAIT and CIDA, to work with countries to develop GHG measurement strategies, build

capacity to support climate change negotiations, set reduction targets and develop GHG mitigation strategies.

Marketplace mechanisms: Environment Canada is developing the capacity to implement innovative mechanisms to meet our national reduction targets. For example, we are working with industry to examine how a public-private partnership may facilitate private sector involvement in the GHG market (purchasing credits from emissions reduction activities abroad). The Climate Change Plan calls for Canada to purchase up to 10 MT per year in GHG credits and has entered into discussions with Russia on opportunities for emissions trading and "greening the permits" (i.e., ways to ensure that emission credits would be reinvested in green projects). These and similar efforts have positioned the Department to support Canada's action plan and mitigation strategies using international marketplace mechanisms to our best advantage.

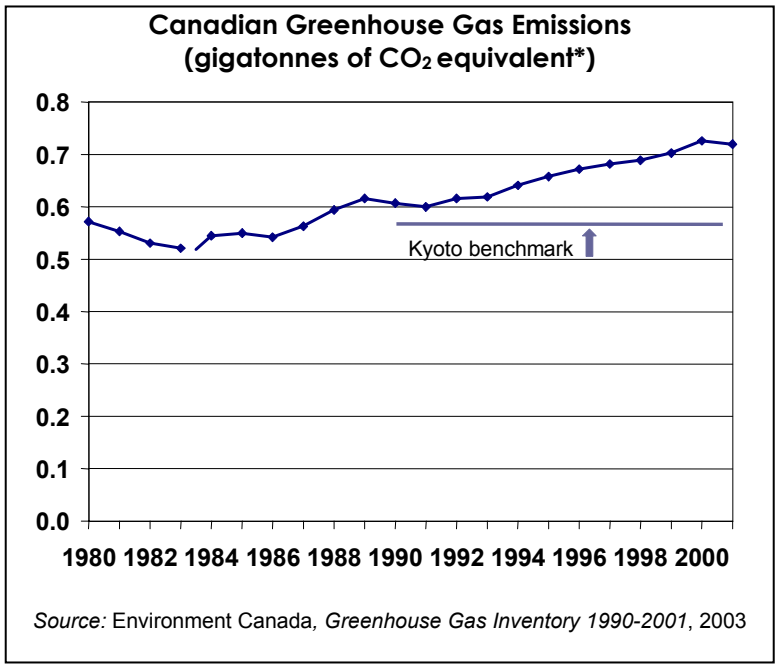
Public education and outreach: Over the past five years the CCAF-PEO program has resulted in more than 250 project-based partnerships with the provinces, territories, the private sector, communities, NGOs and educators. These projects have helped to educate Canadians on the links between actions to reduce GHG emissions and climate change, as well as other environmental, social and economic benefits - i.e., cost savings, cleaner air, more livable cities, technological innovation and a better quality of life for Canadians.

Efforts to educate Canadians about climate change are paying off. Nine in ten are aware of the issue, and more than one in six (16%) now identify climate change as the top environmental issue facing the country (up from only 2% in 1999.) Even more important, close to eight in ten Canadians (78%) now acknowledge that there is something they can do personally to address this problem, up ten points since 2001, and well above the 54% measured in 1998. A large majority says that they are taking steps in their daily lives to reduce their emissions. While these findings may overstate the true level of effort taking place, it is an accurate reflection of growing social values and a sense of personal and collective responsibility around environmental protection generally and climate change specifically. (Decima Research, 2003)

Scientific understanding: Science investments have led to a national plan for climate-system monitoring, a new climate impacts scenarios facility, and improved climate models. Our science has led to a better understanding of the role of forests and agricultural lands in climate and carbon balance. Northern research has led to better information on extreme weather and the impact of climate change in the Arctic. This knowledge provides the basis upon which meaningful targets can be set, market mechanisms defined (e.g. offsets) and adaptation strategies developed.

Despite our efforts, as shown in the chart below, GHG emissions in Canada continued to rise during the late 1990s. Since 1990, Canadian GHG emissions have increased by 18.5%. However, emissions declined by 1.3% between 2000 and 2001. This is the first year-to-year decline since 1991, and the first time emissions have dropped despite economic growth. Also, since 1990, Canada's "emissions intensity" — the amount of GHGs emitted per unit of economic activity – has been declining by an average of about 1% per year.

The Department is confident that the groundwork established over the last ten years positions Canada to move towards its commitment. The magnitude and complexity of the climate change issue mean that significant GHG reductions cannot be expected before the infrastructure (international rules and GHG measurement, verification and reporting systems) is in place, market mechanisms are operational and individual behaviours are changed.



Source: Environment Canada, *Greenhouse Gas Inventory 1990-2001*, 2003

- For more information on the Government of Canada's overall progress on the climate change issue, please refer to: Climate Change: The Federal Investment 1997-2002 Comprehensive Report, published June 2003.

Major performance accomplishments of 2002-2003

The major accomplishment of the climate change agenda in 2002-2003 was the December 17 deposition of Canada's Instrument of Ratification for the Kyoto Protocol following votes in the House of Commons and the Senate. Ratification commits Canada to reduce its GHG emissions to 6% below 1990 levels by the 2008-2012 period (Canadian estimated reduction of 240 Mt from Business As Usual projections). The decision followed extensive consultations with other levels of government, industry and Canadians on draft option papers and plans prepared by the Government of Canada, with Environment Canada playing a key role[1].

Central to the ratification decision was the workable blueprint for achieving our climate change objectives. Achieving Our Commitments Together: Climate Change Plan for Canada (November 2002) is a plan that provides a clear framework for the way forward while allowing for continuous adjustment as we assess our progress. The Plan identifies action in five broad areas: transportation, housing and commercial/institutional buildings, large industrial emitters, small and medium-sized enterprises, and the international

[1] First round consultations on a draft discussion paper included: 27 meetings with industry and stakeholder workshops in 14 cities involving 230 industry representatives, 186 FPT representatives and 90 environmental group representatives. Written submissions were received from more than 70 stakeholder groups. A second round of more targeted consultations were convened with representatives of six large industrial emitter groups, labour organizations and other select stakeholders.

market. In Budget 2003 the Government committed $2 billion over five years to implement the Plan.

- For more information on the consultations and to view the Plan, please visit: www.climatechange.gc.ca/plan_for_canada/climate/kyoto.html

The One-Tonne Challenge

The everyday actions of Canadians produce more than one quarter of our country' s total greenhouse gas emissions. The Government of Canada is calling on every Canadian to reduce his or her individual emissions by one tonne per year or about 20%.

Other select accomplishments include:

- The $15 million Pilot Emission Removals, Reductions and Learnings (PERRL) program was launched in October 2002. PERRL is designed to provide Canadian companies with an economic incentive to make immediate GHG emission reductions and to build capacity in the measurement and verification of GHG reductions. The first set of reductions will be reported in 2003-2004.
- Forty-seven new CCAF-PEO projects are now under way across the country.
- All jurisdictions but Quebec, Ontario, and Nunavut have established PEO Hubs that are working locally to build awareness and understanding of climate change and motivate action.
- The Department has been championing climate change co-benefits and recent efforts helped ensure that the new $3 billion Infrastructure Program (announced in Budget 2003) will apply a climate change lens to project selection and thereby encourage activity in areas such as transit.

What are the next steps and future challenges?

Environment Canada's next steps are guided by the Climate Change Plan for Canada. The Plan proposes five instruments to meet the Kyoto commitment:

- For Large Industrial Emitters (LIE), (e.g. transportation, oil and gas, electricity, mining, manufacturing and buildings sectors) covenants will be established, with regulatory or financial backstops, supported by emissions trading with access to domestic offsets and international permits;
- An Opportunities Envelope will enable the federal government to partner with the provinces and territories through co-investments in cost-effective GHG emission reduction projects/programs in the areas of mutual interest;
- Strategic investments in infrastructure projects will ensure that climate change-related projects will be given particular consideration;
- Increased investments will be made in innovation/technologies for climate change; and
- Targeted measures that will include a national, social marketing campaign (the One-tonne Challenge), incentives, regulations and tax measures (including a domestic emissions trading system, and the purchase of carbon credits in the international marketplace).

Some of the challenges faced by Environment Canada, along with the Climate Change Secretariat and other government departments, are to:

- Develop a renewed climate change management and governance structure;
- Enhance GHG monitoring, verification and reporting;

- Increase collaboration with Aboriginal and northern communities to address their priorities and issues regarding implementation of the Plan; and
- Establish links with other policy areas including the Clean Air Agenda, Environmental Technologies, Smart Regulations, and Corporate Social Responsibility.

The Department will continue to be involved in international negotiations, which are now shifting to post-Kyoto topics including: future commitments, negotiations with the major developing country emitters and new mechanisms. Canada will support broader engagement of developing countries during the second attainment period (2012-2017) and assist developing countries to chart a lower emissions path and establish mechanisms for efficient engagement in projects in developing countries.

The Government of Canada will report to Canadians every two years on the effectiveness of the Plan; the first Demonstrable Progress Report will be released in 2005.

AIR QUALITY

What is the issue?

Air quality is a local and regional issue that is affected by human activities, weather, and topography. Air quality affects our health – cleaner air means fewer respiratory diseases among adults, fewer asthma attacks among children, fewer hospital admissions and fewer premature deaths – and Canada's wildlife habitat, agricultural yields and forests.

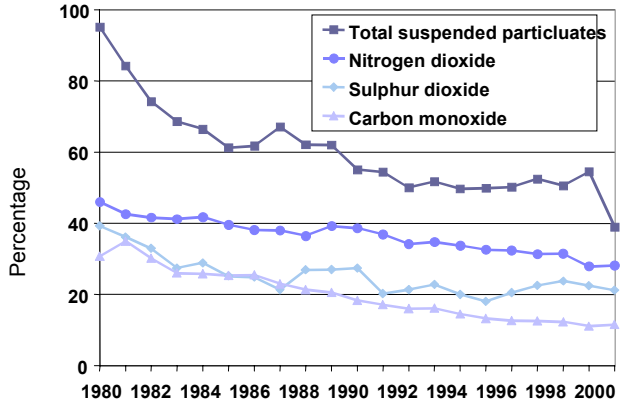
Although there have been improvements in levels of airborne pollutants in many parts of Canada, both urban and rural, many Canadians continue to experience periods of unacceptable air quality, especially in the summer. A number of pollutants, alone or in combination with each other, reduce air quality. Together the pollutants are often called smog, which in Canada consists mostly of ground-level ozone and microscopic airborne particles known as particulate matter (PM). Ground-level ozone and over one-half of PM concentrations are produced through the reaction of other air pollutants, called precursor gases, that include nitrogen oxides (NO_X), volatile organic compounds (VOCs), and sulphur dioxide (SO_2). These gases come primarily from human activities, such as burning fossil fuels in motor vehicles, smelters, homes, thermal power plants and other industries, and the evaporation of solvents but, in the case of VOCs, can also come from natural sources. Ground level ozone is very dependent on sunlight and warm temperatures so it is a concern in the spring and summer. It is of particular concern in the Windsor-Quebec City corridor and, to a lesser extent, in the southern Atlantic region and the Lower Fraser Valley in British Columbia.

What are we doing about it?

While several other important pollutants have dropped over the last ten years, VOC emissions have not shown much of an improvement. While changes in the methods for measuring PM make it difficult to establish a trend, we know that daily levels in many areas pose a health risk. Much of the Department's effort is focused on addressing these pollutants.

Environment Canada's broad policy and program strategy for addressing air quality issues is detailed in the 10-year Clean Air Agenda that was approved in May 2000. The Agenda focuses on:

Concentrations of total suspended particulates, nitrogen dioxide, sulphur dioxide and carbon monoxide found in urban air in Canada.



Source: Environment Canada, *Environmental Signals,* 2003

- Working in partnership with provincial and territorial environment departments to attain and improve targets for Canada-wide Standards (CWS) for particulate matter (PM) and ozone;
- Reducing transboundary emissions;
- Reducing transportation sector emissions and major industrial emissions;
- Advancing science on air quality;
- Increasing public engagement to reduce air pollution; and
- Expanding air quality monitoring and forecasting to inform the public, protect public health and monitor the progress of our air pollution control strategies.

Over the years, our approach to air issues management has evolved to encompass the following critical success factors:

- **Sectoral strategies:** Experience has shown that the strategies for reducing emissions are most successful when they take an integrated, long-term view of the problem. The Agenda for Vehicles, Engines and Fuels, a key element of the Clean Air Agenda, reflects this strategy. First, the Agenda takes a systems approach to reducing emissions and considers fuel, engines and vehicles in an integrated program of activity. Secondly, the Agenda has a 10-year time horizon and charts a course for continual improvement. As engine and vehicle design precedes market launch by three to four years, manufacturers must be given appropriate notice to incorporate new standards. Finally, the Agenda is written in the context of the North American market and builds upon U.S. EPA standards and timelines where possible.

- **Partnerships:** A key element of Environment Canada's response to air quality issues, and a key objective of the Clean Air Agenda, is to mobilize others (industries, communities, NGOs, provinces and territories) to take action. An important example is the commitment by the provinces and territories to the CWS process. Partnerships are also used to advance research and our understanding of the impact of air quality on human and environmental health. Several NGOs, including the Canadian Medical Association (CMA) and the Canadian Lung Association, are actively involved in defining and addressing the effects of air pollution on human health.
- **Co-operation and harmonization with the U.S.:** Harmonization of Canada's emission standards with those of the U.S. can be used to raise the bar in both countries. The success of this approach can be seen in the co-ordinated and effective response to acid rain in the 1980s and 1990s. Emissions of sulphur dioxide (SO_2), one of the pollutants that causes acid rain, have declined by 45% in Canada and over 35% in the United States, from 1980 levels.

Clean Air Strategic Alliance

Clean Air Strategic Alliance (CASA), established in March 1994 as a new way to manage air quality issues in Alberta, is a not-for-profit organization composed of representatives from government, industry and non-government organizations. Their mandate is to bring together diverse stakeholder groups to solve Alberta's air quality problems on a consensus, rather than adversarial, basis. Prairie and Northern region has played a key participatory role in this alliance, positioning the Department for negotiations in the Clean Air Agenda, and obtaining support and action for clean air initiatives.

One of the projects sponsored by CASA involves flaring and venting reduction strategies for the oil and gas sector. Flaring is the burning off of industrial waste gases during well testing and production operations. It is a significant source of toxic air pollutants

In 2002, CASA completed an in-depth evaluation of the issues and made 39 recommendations to reduce flaring and venting in the province based on the very successful framework for reducing solution gas flaring implemented in 1999. The framework entails a voluntary approach supported by regulatory requirements. The study recommends the framework for solution gas flaring be adapted and applied to well test flaring, and solution gas venting. Recommended processes will help operators determine if it is possible to eliminate or economically avoid flaring or venting. Operators can also examine ways to reduce or minimize flaring or venting when economic elimination is not possible, and can work to ensure effective performance standards are maintained for flares or vents.

What have we accomplished?

Cumulative performance

Canada has achieved great success in a number of air issue areas: the approach to transboundary air issues management is well established, as are the regulatory frameworks for transportation-related air issues management. The Department continues to provide support to provinces and territories, who are ultimately responsible for performance in a number of sectors, to meet international obligations including CWS on PM and ozone. Accomplishments over the last few years associated with the major elements of the Clean Air Agenda are follows:

- **Canada-wide Standards on PM and Ozone:** In 2000, the Canadian Council of Ministers of the Environment (CCME), with the exception of Quebec, adopted Canada-wide Standards (CWS) for PM and ozone. The Ozone Annex to the 1991 Air Quality Agreement (signed in December 2000) further commits Canada to accomplish very specific results related to transportation, and air quality monitoring and reporting. Since that time, Environment Canada has worked with each of the seven industry sectors targeted by the CWS to characterize sector emissions, set reduction targets (by sector and province) and propose sector strategies. The CWS will be reviewed in 2005, at which point the opportunity for improving targets will be reviewed. This model of co-operation has proven successful and will be applied to other areas; for example, the possibility of a similar process for municipal wastewater effluents is being explored. (See following section on Toxics for more detail.)

Pacific 2001

Most Canadians live within 100 km of the Canada-US border and the prevailing south-to-north wind direction mean that transboundary (Canada-US) relations on air issues is critical to the achievement of our air quality goals.

Led by Environment Canada, an international team of scientists undertook a study in the Fraser Valley (called Pacific 2001) to improve awareness of air pollution in the region and in other parts of Canada. More than 130 Canadian researchers collected data on the complex atmospheric processes that create air pollution in the Valley. In parallel, researchers based in Washington State conducted a complementary field campaign that extended southward over the Puget Sound.

The study provides information on the sources, formation and distribution of PM and ground level ozone key smog-causing pollutants in the Fraser Valley. Results from sampling locations confirmed the impact motor vehicles are having throughout the Valley. Measurements of fine PM in Vancouver were compared with similar measurements at Langley and Sumas Mountain, revealing the importance of sea-salt particles in western areas and the dominance of ammonia in eastern areas.

The composition of these particles helps us understand why haze layers appear differently in western and eastern portions of the Valley. The movement of pollutants eastward out of the Valley into the Strait of Georgia was also documented.

As a result of Pacific 2001, the Fraser Valley has become an internationally recognized laboratory for air quality studies. The many thousands of measurements and subsequent chemical analyses – showing the complex interaction of air pollutants in the Lower Fraser Valley – have been carefully controlled and placed in a data archive, accessible to scientists around the world. This data will also be available to the public by September 2003.

Pacific 2001 provides important information for the review of the Canada–US Ozone Annex in 2004, assists with the implementation of the Canada Wide Standards for PM and ozone and contributes to policy development for international airshed management.

- **Transboundary Emissions:** The Canada-U.S. Ozone Annex to the 1991 Air Quality Agreement was signed in December 2000 to address the problem of transboundary summertime smog pollution. In eastern Canada, the U.S. is the source of Ozone and the precursor emissions of NOx and VOC that contribute to the bad smog days that Canadians experience during the summer months. The 1991 Canada-U.S. Air Quality Agreement has been instrumental in formalizing the roles and responsibilities of the two countries on the issues of acid rain and ground-level ozone. The countries' co-ordinated and focused response to acid rain in the 1980s and early 1990s led to significant reductions in SO_2 (acid rain causing emissions) – evidence that this co-operation benefits human and environmental health. The Agreement, and subsequent Ozone Annex (2000), continue to provide the framework for the on-going co-operation on air issues. Environment Canada's focus is now on implementation of the Ozone Annex commitments and launching the next round of border air-quality projects (see detail on the Border Air Quality Initiative in the following section).
- **Transportation Sector:** Vehicle emissions are the largest contributor to Canada's air GHG and NOx emissions and contribute 8% and 5% of Canada's total PM and SOx emissions respectively. The regulation of vehicles, engines and fuels falls under federal jurisdiction and the Department has a clear responsibility in this area. Since 1971, the federal government has

imposed increasingly stringent controls on emissions from motor vehicles. In February 2001, the Department published a 10-year Federal Agenda on Cleaner Vehicles, Engines and Fuels. The Plan commits the government to action on a number of items including regulations for on-road, and off-road, engines and vehicles; and, the introduction of standards for reducing sulphur in various fuels. With the regulatory framework essentially in place, Environment Canada's role will move towards one of compliance promotion, monitoring and reporting.

- **Air Quality Monitoring, Forecasting and Reporting:** Environment Canada has established a substantial air quality monitoring network that is delivered in partnership with the provinces and territories. The key elements of the monitoring infrastructure are the National Air Pollution Surveillance (NAPS) network with 239 sites, and the Canadian Air and Precipitation Monitoring Network (CAPMoN). Reports on pollutants emissions are gathered by the National Pollutant Release Inventory (NPRI). In 2002, the Department committed $29 million over four years to upgrade the NAPS and CAPMoN networks to expand the network by 20 sites and upgrade monitoring equipment. Our goal is to ensure that Canada has the monitoring capability to report on Canada-wide Standards and Ozone Annex commitments, support the National Air Quality Prediction Program and collect data that will guide future actions on emissions reduction. The Government of Canada is committed to establishing a national air quality prediction program that will make daily, up-to-date information on impending air quality available to Canadians in most parts of the country. Current regional programs, of which INFO-SMOG (see box) is one example, reach more that 60% of Canadians.

Info-Smog

Over one-half of all Canadians live in areas where ground-level ozone may reach high-levels during the summer months and every urban centre has levels of airborne particles that are high enough to cause health impacts. Providing accurate and timely information to all Canadians will allow them to take appropriate action to protect their health

In Quebec, INFO-SMOG is smog forecasting and information program to inform and advise the public when smog concentrations reach or may reach levels that are harmful to health and the environment. The program also suggests ways for the public to contribute to improved air quality.

This joint venture, now in its 10th year, is the result of Environment Canada's co-operation with Quebec Department of Environment, and Department of Health and Social Services, in co-operation with the Public Health Departments, and the Environment Department of the City of Montreal.

INFO-SMOG warnings are also communicated to the public with the help of partners in the urban transportation sector, namely the Quebec Department of Transport and the Société de transport de Montréal through the use of electronic signs on highways serving southern Quebec, electronic banner screens in Montreal metro stations and through its Info-Travaux hotline.

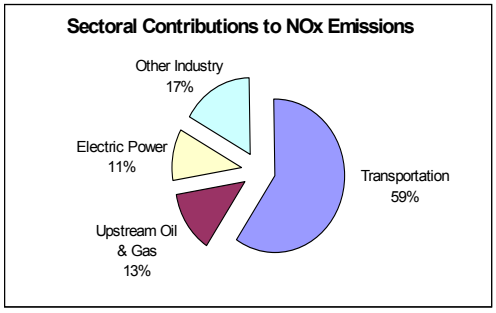
INFO-SMOG uses surface ozone concentrations to issue a daily forecast of air quality; its three categories are good, fair and poor. If the air quality is poor, a warning is issued along with a health-related message for people at risk and suggestions for practical action to prevent further degradation of air quality.

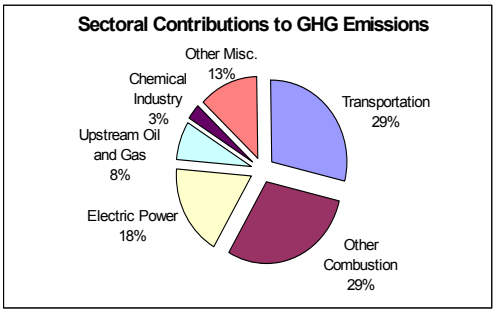
In the wintertime INFO-SMOG forecasts the meteorological conditions that can lead to the accumulation of pollutants such as PM and carbon monoxide and advises the public on pollution reduction and health protection actions.

◗ More information on the Air Quality Forecast Program can be found in Section 4.3

- **Public Engagement:** The Department has a number of on-going programs and services in place to engage Canadians to take action on clean air. With increasing support for climate change, the Department continues to educate Canadians on the links between action on climate change and co-benefits for air quality.

In addition to the smog-related activities discussed above, the Department continues to support other actions. In 2001, Canada became the first country to sign and ratify the





United Nations Convention on Persistent Organic Pollutants (POPs). The global agreement will reduce or eliminate emissions of 12 toxic substances, including PCBs, DDT, dioxins and furans. Environment Canada remains committed to international control regimes for POPs and heavy metals, and continues to implement the CWS for mercury emissions and products. The Department continues to cooperate with provinces and territories to implement the Canada-wide Acid Rain Strategy for Post 2000. Recently announced further cuts in sulphur dioxide emissions of about 50% in four eastern provinces will help reduce acid deposition. Canada will now seek similar further cuts from the United States to allow critical loads to be met across the regions.

Major accomplishments of 2002-2003

A number of key accomplishments in 2002-2003 were related to our vehicles, engines and fuels agenda:

- On July 1, 2002 the *Sulphur in Gasoline Regulations*, published in 1999, came into effect. These regulations limit the average level of sulphur in gasoline to an interim 150 parts per million, and call for an average sulphur content of 30 ppm (a reduction of 90% from pre-regulated levels) throughout Canada by 2005.
  The *Sulphur in Diesel Fuel Regulations* were published in the Canada Gazette Part II on July 31, 2002. The Regulations limit sulphur in on-road diesel fuel to 15 ppm starting in 2006; this represents a 97% reduction in sulphur content from the current maximum level of 500 ppm. This reduction will enable the introduction of advanced emission control systems for diesel vehicles (e.g. trucks and buses).
- The *On-road Vehicle and Engine Emission Regulations* were published in the Canada Gazette, Part II, in January 2003. The Regulations will come into effect in January 2004 and align Canadian emission standards with those of the U.S. Environmental Protection Agency (EPA), which are recognized as the most stringent national standards in the world, for light-duty vehicles, light-duty trucks (e.g. vans, SUVs), heavy-duty vehicles (e.g. buses) and motorcycles. The Regulations will reduce allowable emission levels from new on-road vehicles by up to 95% by 2009.[2]

[2] In June 2002, pending full implementation of these new regulations, an MOU between Environment Canada, the Canadian Motor Vehicle Manufacturers' Association and the Association of International Automobile Manufacturers

- Draft regulations to reduce smog-forming emissions from small spark-ignition engines were proposed in Canada Gazette Part I in March 2003. The regulations, to take effect in 2005, would reduce smog-forming emissions (NOx and HC) by about 44 percent.
- Another significant accomplishment is the Canada-U.S. Border Air Quality Initiative, announced in 2003. The announcement launched three major pilot projects that will help pave the way for future reductions in smog and improve health in both countries. The projects are: the Georgia Basin/Puget Sound International Airshed Strategy; a transboundary airshed management project within the Great Lakes Basin, beginning with the southeastern Michigan/southwestern Ontario Region; and a study of NOx and SO2 cap and trade emissions trading. Environment Canada will coordinate Canada's efforts. Also, the biennial 2002 Progress Report on the Canada-U.S. Air Quality Agreement was released by the U.S. and Canadian governments in December 2002.

In 2002-2003, the Department implemented key initial actions on the CWS for PM and Ozone, including:

- In July 2002, the draft order recommending the addition of PM precursors and ozone and its precursors to the CEPA 1999 List of Toxic Substances to secure federal authority for action was published (Canada Gazette Part I). The final order was published in Canada Gazette Part II on July 2, 2003.
- The CWS on PM and ozone call for joint action to achieve emission reductions in seven industrial sectors: electric power generation, pulp and paper, lumber and allied wood products, iron and steel, base metal smelting, concrete batch mix plants and hot mix asphalt paving plants. The Department, working with the provinces and territories, industry, and NGOs completed Foundation Reports for each of these sectors that include technical feasibility studies on reduction options, their associated emission reductions and costs, best management practices, and competitive analysis and policy instruments. These reports will support the development of co-ordinated, regional multi-pollutant emission reduction strategies (MERS) that will be written in co-operation with the provinces and territories, industry and NGOs.
- The New Source Emission Guidelines for Thermal Electricity Generation, under the *Canadian Environmental Protection Act*, came into force on April 1, 2003. These revisions bring the Guidelines up-to-date with respect to current best-available technologies (BAT) and provide tighter emission guidelines to reduce smog and acid rain pollutants from new coal, oil and gas fired power plants.

Clean Air Day (June 5, 2002) was proclaimed in 1999 to increase awareness and action on both clean air and climate change. In 2002, thanks to a growing number of national and local partners, Clean Air Day was the focal point for 2 major national events (as well as local events). The **Commuter Challenge** is a week-long event which encourages communities and municipalities to engage in a friendly competition to reduce emissions through sustainable transportation choices. In June 2002, more than 47,000 Canadians from more that 34 communities across Canada participated in Commuter Challenges. The 3rd Sustainable Transportation Awareness Campaign delivered in 65 communities by the Canadian Urban Transit Association is aimed at promoting sustainable transportation through advertising and local activities organized on Clean Air Day by the transit companies and their partners.

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of Canada was signed. The MOU formalizes industry' s commitment to market the same low-emission vehicles in Canada as in the United States for the 2001–2003 model years.

- For more information on Clean Air Day, visit: www.ec.gc.ca/cleanair
- For more information on the Commuter Challenge, visit: www.commuterchallenge.ca

Several steps were taken in 2002-2003 to improve monitoring and reporting. While improvements continue to be made to the NAPS network, Environment Canada also launched a process to expand industry reporting through NPRI on seven common air pollutants, especially those that contribute to smog. By 2004, the number of industrial facilities providing data to NPRI will increase from 2,000 to over 7,000. The Department also improved Canadians' access to industrial emissions and NPRI data through new on-line query capabilities for criteria air contaminant emissions.

- For more information on NPRI data, visit: www.ec.gc.ca/pdb/npri/npri_home_e.cfm

In the summer of 2002, local daily air quality forecasts were provided in regions of British Columbia, Ontario, Quebec and Atlantic Canada, covering more than 60% of the population. Finally, public education and outreach activities were continued and included Clean Air Day, the Sustainable Transportation Awareness Campaign (delivered in 65 communities with the Canadian Urban Transit Association) and the Commuter Challenge.

What are the next steps and future challenges?

The momentum on the Federal Agenda for Cleaner Vehicles, Engines and Fuels will be continued. With on-road regulations in place, the Department will focus on completing regulations for off-road engines and vehicles (e.g. engines in lawn equipment, forklifts, personal watercraft, snowmobiles, and agricultural and construction machines) and the compliance promotion, monitoring and reporting functions associated with implementation of on-road regulations.

Significant opportunities lie ahead for smart regulations, federal-provincial relationships and other partnerships. Specifically, we will explore in greater depth the prospects for a future PM annex to the Canada-U.S. Clean Air Quality Agreement. A key partnership to meeting the Clean Air Agenda commitments to reduce transboundary emissions is the Canada-U.S. Border Air Quality initiative announced on June 23, 2003. Under the Strategy, we will continue to identify collaborative activities and develop regional strategies to co-operatively respond to air pollution in the Great Lakes Basin and in southern British Columbia's Georgia Basin/Puget Sound airshed and to explore emissions trading. The Strategy also supports our commitment to advance the Air Quality Forecast and Air Quality Index programs to cover more communities and more pollutants. The Department will also work with the medical community, provinces and non-government organizations to develop a health-risk based Air Quality Index that can be used across the country. The existing collaboration on implementation of the CWS for PM and ozone will also continue, including work on planning for and performing the reviews of the CWS to be presented to the Canadian Council of Ministers of the Environment in 2005 and 2010. The Department will continue to integrate the clean air and climate change agendas, illustrating and supporting the environmental, human health

and economic co-benefits of policies and measures. The integration will be supported through public education and outreach activities, policy co-ordination, technology development programs and co-ordinated work on emissions reporting. Sector strategies will be pursued where possible. For example, building on the new regulations for thermal electricity generation (April 2003), we will work towards an electricity sector vision that brings together smog, acid rain, toxics and climate change priorities, capitalizes on federal initiatives and promotes further action by the electricity sector, provinces and citizens.

4.1.2 Key Result: Toxic Substances

Understanding and prevention or reduction of the environmental and human health impacts posed by toxic substances and other substances of concern

TOXIC SUBSTANCES

What is the issue?

The *Canadian Environmental Protection Act* 1999 (CEPA 1999) defines a substance as toxic if it enters the environment in a quantity that has, or may have, a harmful effect on human health, the environment or the environment on which life depends. Toxic substances come from many industrial, agricultural, and domestic sources and, once released into the environment, can be dispersed to remote regions in air and water currents.

Some toxic substances persist in the environment and, while present in only small amounts, can affect many species and ecosystems. Other substances build up in the tissues of living organisms that many Canadians consume. Aboriginal peoples, Inuit and others who consume these species on a regular basis are particularly vulnerable. While toxic substances can affect all Canadians, the greatest health risk is to susceptible populations such as young children and the elderly.

Addressing the problem of toxic substances is complex. Some substances are concerns in themselves (e.g. mercury) while others form part of a larger environmental and health issue (e.g. smog, water quality, and arctic contamination). Toxic substances may be released from point sources, such as an industrial plant, or non-point sources, such as vehicles, and some can originate from beyond our borders.

What are we doing about it?

> ***Canadian Environmental Protection Act 1999***
>
> The goal of the Act is to contribute to sustainable development through pollution prevention and to protect the environment, human life and health from the risks associated with toxic substances.

CEPA 1999 provides the overall framework for preventing and managing the risks posed by toxic substances. The Act recognizes the contribution of the management and control of toxic substances and hazardous waste to reducing threats to Canada's ecosystems and biological diversity. Environment Canada has primary responsibility for CEPA 1999 implementation and jointly administers the research, categorization, assessment and management of toxic substances with Health Canada.

CEPA 1999 requires the categorization (identification of substances that are persistent, bio-accumulative and inherently toxic, or those with the greatest potential for human exposure) of the 23,000 substances on the Domestic Substances List (DSL) by 2006.[3] In addition, the Department responds to the approximately 1,000 new substance notifications received per year. This number is expected to increase with the growth in biotechnology products.

- For details on CEPA 1999, please refer to: www.ec.gc.ca/CEPARegistry

> **Risk Management Tools**
>
> These tools are considered when developing a Risk Management Strategy:
>
> - CEPA 1999 Instruments: regulations, Pollution Prevention (P2) Plans, Environmental Emergency (E2) Plans, codes of practice, environmental quality guidelines;
> - Voluntary approaches: Environmental Performance Agreements (EPAs), MOUs, federal/provincial/territorial initiatives;
> - Market-based Instruments: tradable permits, deposit refunds;
> - Provincial/Territorial Acts: regulations, permits; and
> - Other federal Acts: e.g., *Fisheries Act, Pest Control Products Act, Hazardous Products Act.*

Canada's Toxic Substances Management Policy takes a preventative and precautionary approach to dealing with all substances. The Policy sets out two overall objectives:

- Virtual elimination from the environment of toxic substances that result predominantly from human activity and that are persistent and bio-accumulative (Track I substances); and
- Management of other toxic substances and substances of concern, throughout their entire lifecycle, to prevent or minimize their release to the environment (Track II substances).

CEPA 1999 provides the legislative framework to meet the objectives of the Toxic Substances Management Policy. The Act encourages innovation in environmental

[3] The DSL is an inventory of approximately 23,000 substances manufactured in, imported into, or used in Canada on a commercial scale. Environment Canada is responsible for assessing not only DSL substances but also items such as manufacturing by-products, effluents and emissions.

protection measures, providing new levers for environmental management and new opportunities and instruments for partnership with industry to put in place pollution prevention policies and programs. Specifically, the Act requires the Department to undertake a risk assessment — categorize 23,000 substances on the DSL, and conduct a screening assessment for those categorized as persistent and/or bio-accumulative and inherently toxic. There are three possible outcomes to a screening assessment: (1) no further action; (2) declared toxic and added to Schedule 1 of CEPA 1999 (List of Toxic Substances); or, (3) added to the Priority Substances List for further assessment.

- *Risk management* — to develop and implement a risk management strategy for all substances deemed toxic. Risk Management strategies detail how the risks to human health and the environment will be addressed using a range of tools (see box for examples) that may be used to control any aspect of a substances life-cycle.
- *Waste management* — to ensure that toxic chemicals and hazardous wastes are managed and disposed of safely, address issues associated with ocean disposal and the protection of coastal, estuarine and marine environments from the negative impacts of land-based activities and sources of pollution, and environmental emergency planning;
- *Compliance and enforcement* — to help regulated communities conform with environmental laws. Compliance includes both compliance promotion and enforcement activities. Environment Canada promotes compliance through fact sheets, manuals, guidelines, workshops and notices in the Canada Gazette. Enforcement includes inspections, and in cases of non-compliance, investigations. Confirmed violations are addressed through the use of one or more enforcement tools such as warnings, directions, tickets or environmental protection compliance orders; and workshops and notices in the Canada Gazette. Enforcement includes inspections, and in cases of non-compliance, investigations. Confirmed violations are addressed through the use of one or more enforcement tools such as warnings, directions, tickets or environmental protection compliance orders; and
- *Monitoring and reporting* — to collect information through National Pollutant Release Inventory (NPRI), CEPA Registry, industry Environmental Effects Monitoring and other avenues and make data available to Canadians.

In addition to environmental considerations, socio-economic considerations are fully integrated in management tools and decision-making to ensure sustainable development and the maximization of benefits for Canadians.

What have we accomplished?

Cumulative performance

Our challenge is to protect human health and the environment by influencing behaviour towards more environmentally sound practices. This involves the development of new risk management tools and approaches, which increasingly emphasize pollution prevention and voluntary initiatives based on partnerships and innovation. Since CEPA 1999 was proclaimed in 2000, the Department has focused on:

- Completing our commitments under CEPA 1988;
- Developing strategies to meet the timelines associated with CEPA 1999; and

- Completing pilot studies to streamline our procedures to ensure that all CEPA requirements (e.g. categorization of DSL substances by 2006) will be met.

Canada is recognized as an international leader in the use of innovative tools – including regulatory action, market-based initiatives, information disclosure and industry led voluntary programs – to address toxic substances risk management.

As regulatory and non-regulatory frameworks are completed over the next two to three years, the Department's focus will shift towards compliance promotion and enforcement. Cumulative progress against our toxic substances management objectives and mandate is summarized below.

Risk Assessment: The Department is on-track to meet the legislated requirement to have all 23,000 DSL substances categorized by 2006.

As of March 2002, data on the persistence, bio-accumulation potential and aquatic toxicity for approximately 12,000 organic chemicals on the DSL was made public. The introduction of Screening Assessments in CEPA 1999 has allowed for a more efficient and effective method to assess existing substances. A guidance manual for Screening Assessments is currently being developed, and a pilot project is under way to improve the categorization, data collection and assessment processes.

Risk Management, Pollution Prevention and Waste Management: As with the Department's approach to managing air issues, the Toxic Management Process is increasingly taking a multi-pollutant, sectoral approach to addressing pollution control. This trend is illustrated by the specific 2002-2003 accomplishments detailed below.

Environment Canada continues to make use of the range of flexible risk management tools available. New tools include Pollution Prevention (P2) Plans, Environmental Emergency (E2) Plans and, voluntary agreements such as Environmental

Enviroclub

Environment Canada uses a range of tools to protect the environment, including regulations, guidelines, codes of practice, economic instruments, challenge programs, and educational campaigns. Feedback from international environmental agencies shows that Canada is at the forefront with respect to voluntary programs and innovative management approaches that complement traditional regulatory activity.

One such innovative initiative designed to influence the environmental behaviours of industry is the Enviroclub program. This program is delivered through a horizontal partnership between Environment Canada, Export Development Canada, National Research Council Canada, and the Climate Change Action Fund. Based in Quebec, the program seeks to encourage small and mid-sized manufacturing firms (SME) to voluntarily reduce harmful emissions and reduce their reliance on natural resources. The initiative has two components: in-plant execution of viable pollution prevention projects and raising awareness of eco-efficiency.

For the 18 participating SMEs, Enviroclub produced real environmental and economic benefits as measured and estimated by comparing prototype and conventional production processes. Environmental results include the annual reduction of the following:

- 24,000 tonnes of greenhouse gases (equivalent to the average annual operation of 5,000 cars);
- 508 tonnes of hazardous wastes (including toxics such as organic sludge and solvents);
- 1,000 cubic metres of wood (equivalent to 10,000 trees); and
- 1,300 litres of petroleum products and 33,000 cubic metres of natural gas.

In addition to the environmental benefit to society, the participating companies, in total, are expected to benefit economically in the amount of $1.5 million a year.

Performance Agreements (EPAs). EPAs contain clear environmental objectives, results measurement and verification strategies, public reporting requirements, and consequences for non-compliance. These new tools may be less expensive to implement, provide greater flexibility, and complement the current regulatory framework. The authorities under CEPA 1999 provide a "regulatory backstop" and reduce the likelihood of non-compliance. Currently, there are two EPAs and one MOU in place.

The Department also benefits from the engagement of other federal departments. For example, Agriculture and Agri-Food Canada is taking action on farm sources of ammonia, Health Canada is moving forward on assessing the environmental effects of products regulated under the *Food and Drug Act* and DFO and CFIA are taking responsibility for the regulation of transgenic fish and animals.

In 2002-2003, the Department put in place a new structure designed to reinforce the links that exist between the complementary segments of the "compliance continuum": compliance promotion, compliance monitoring, compliance verification and compliance enforcement. This Compliance Assurance Team, which has a research, evaluation and functional guidance role, will help the Department make better priority setting, targeting and resource allocation decisions regarding its compliance promotion and enforcement activities.

Monitoring and Reporting: The Canada Gazette notice for reporting to the NPRI for 2002 was published December 29, 2001 and an amendment was published on December 28, 2002 to revise or clarify certain provisions for 2002.

The NPRI included for the first time requirements to report criteria air contaminants which include sulphur dioxide, carbon monoxide, oxides of nitrogen, volatile organic compounds, particulate matter of 2.5 microns or less (PM2.5), particulate matter of 10 microns of less (PM10) and particulate matter of 100 microns or less (total particulate matter). This will provide information required to compile and publish comprehensive inventories of these air pollutants every year rather than every 5 years as had been the case.

Hexavalent chromium was added and thresholds for reporting cadmium, arsenic and lead were lowered.

Reporting requirements for municipal wastewater facilities were amended to increase the number of facilities from this sector reporting to the NPRI. Existing guidance documents were amended and new guides for criteria air contaminants and wastewater treatment facilities were developed. Compliance promotion activities were expanded to advise those who may be required to report of the new reporting requirements.

Major performance accomplishments of 2002-2003

Risk Assessment

New Substances

- Over 70 recommendations for streamlining the New Substance Notification (NSN) Regulations and improving the overall program (e.g. transparency, service delivery, international co-operation) were made in May 2002 after consultations with industry, in

partnership with Health Canada. The revised regulations are scheduled for implementation by 2005. These streamlined regulations will contribute to the Government's effort to develop Smart Regulations, which are more efficient, transparent and reflect a consultative process.

- On August 2, 2002, Canada and Australia signed a formal arrangement aimed at aligning national notification and assessment systems for new chemicals. The Canada/Australia Arrangement is in keeping with the Organization for Economic Co-operation and Development (OECD) Task Force on New Industrial Chemicals and is being viewed as a model for other arn from each other and harmonize national new industrial chemicals management schemes.

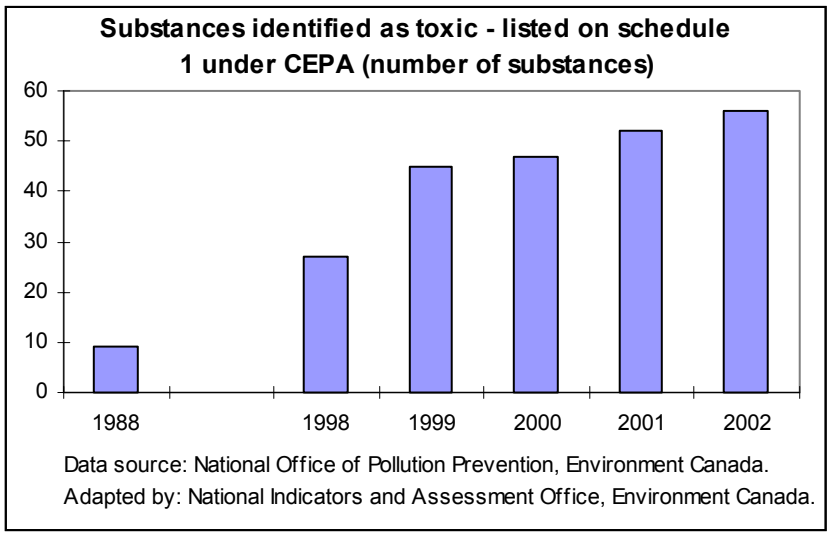
Existing Substances

Categorization

- In 2002-2003 the Department moved forward on its commitment to categorize the 23,000 DSL substances and by the end of the fiscal year had made data on 12,000 organic chemicals available to the public. Also, to support a more streamlined approach, the Guidance for Categorizing Organic Substances on the Domestic Substances List document was made available in Spring 2002.

Assessment

- The Department continues to gain experience in implementing Screening Assessment (SA) on a number of organic substances, the results of which will be used to refine the SA methodology, the criteria for moving to a more comprehensive assessment, and the methodology for prioritizing substance assessment. If an SA determines a substance to be toxic, then it may be proposed for addition to the List of Toxic Substances and is considered for regulatory or other risk management control.



- The Priority Substances Lists were established in 1989 and 1995. The Department is continuing the assessment and regulatory work necessary on these substances. Ten draft follow up reports were published for PSL 1 substances for which there was originally insufficient information to conclude whether they were toxic under CEPA 1988. Four substances were added to Schedule 1 of CEPA 1999 (substances identified as toxic) bringing the total to 56. Another six substances were proposed for addition to the Schedule.

Risk Management

CEPA 1999 sets specific timelines for taking preventive or control action to manage the risks posed by toxics substances. Highlights of the 2002-2003 fiscal year include the use of new, innovative instruments to manage the risks posed by toxic substances. For example:

- Pollution Prevention (P2) Plans: Representing the first use of this authority under CEPA 1999, Environment Canada published notices to require the preparation and implementation of P2 Plans for Acrylonitrile and Dichloromethane. P2 Plans allow the Minister to establish environmental objectives and timelines, recognizes that industry is best situated to take action and uses clear, results-based criteria to assess success. P2 Planning Notices addressing 3 substances were proposed for owners of selected municipal wastewater systems and will be finalized by December 2004. Notices were also proposed to require P2 Plans for toxic substances found in effluents from textile mills.

While this example illustrates the use of flexible, risk management tools, the Department continues to make use of effective, more traditional regulations when appropriate.

In 2002-2003, four final regulations were published in the Canada Gazette (CG) Part II and three were proposed in the Canada Gazette Part I. Regulatory agenda highlights include:

- In March 2003, new federal regulations to reduce pollution from dry-cleaning facilities came into effect. The *Tetrachloroethylene Regulations* will reduce the releases of tetrachloroethylene, commonly known as PERC, from dry-cleaning facilities by 70% from 1994 levels by August 2005.
- *Environmental Effects Monitoring (EEM)*: The *Metal Mining Effluent Regulations* under the *Fisheries Act,* which came into force in December 2002, are among the strongest pollution prevention standards in the world. The regulations now apply to all Canadian metal mines (approximately 100 in seven provinces and three territories),

Sydney Tar Ponds

After 100 years of steel making Sydney's plant ceased operations in 2001, having played a pivotal role in the history, economy, and culture of the surrounding community. The steel-making process, along with other activities in the urban areas surrounding the sprawling industrial complex, also left an environmental legacy - significant industrial pollution throughout the Muggah Creek watershed, which would become the site of perhaps the largest toxic cleanup project in Canadian history.

An increased understanding of the complexity and scope of contamination, led to the development of a community-based Joint Action Group (JAG) working in partnership with three levels of government. JAG presented a series of recommendations to government on how the community wished to proceed toward a cleanup decision, and by May 1999, an agreement to provide $62 million dollars to carry out the studies, design work and other essential preparations for cleanup was approved.

Since the initial confirmation of contamination in the 1980s, the Tar Ponds have had negative implications for Sydney residents. Now, however, the community is entering a new phase that is positive and exciting. Already, the community is seeing improvements on a number of fronts through completion of surface remediation projects including: construction of a interceptor sewer diverting tonnes of raw sewage daily from flowing into the Tar Ponds; the demolition and removal of derelict structures on the Coke Ovens Site; closure and capping of the old Sydney landfill; and remediation efforts at 54 homes north of the Coke Oven, including removal of contaminated top soil, driveways, and decks.

With these key initial steps completed, remarkable efforts from scientists and other experts volunteering weeks of their time, worked with technical experts to prepare a remediation report, providing the JAG, the community and governments with a status report of remaining conditions and a short list of subsurface cleanup options. JAG took that list and developed a workbook to facilitate input on cleanup options, (either acceptable, acceptable with modifications or unacceptable) from residents of the Cape Breton Regional Municipality. A total of 1,754 workbooks were completed through various methods including workshops, open houses, coffee breaks, at home, or on-line.

introduce more comprehensive and stringent effluent quality standards, prohibit the discharge of effluent that is acutely lethal to rainbow trout, and require all mines to conduct a comprehensive EEM program.

- *Environmental Emergencies Regulations* were published in Canada Gazette, Part I on August 10, 2002. The regulations target an initial list of 174 substances. They require any companies that store or use any of these substances, above a specified minimum amount, to provide information to Environment Canada regarding the amounts and storage. This information will help police, fire and other emergency personnel to respond effectively in an emergency. The regulations are targeted for publication in Canada Gazette, Part II by September 2003.
- *The Export of Substances under the Rotterdam Convention Regulations* were published in CG II. These regulations ensure that chemicals and pesticides subject to the Prior Informed Consent (PIC) procedure are not exported to Parties to the Convention, unless the importing Party has provided its consent for the shipment.
- The *New Substances Fee Regulations*, allowing for partial cost recovery for the assessment and notification process, were published in CG II.
- Proposed regulations to implement the Cartegena Biosafety Protocol were published in CG I.
- Ammonia Dissolved in Water, Nonylphenol and its Ethoxylates, Effluents from Textile Mills Using Wet Processes and Chloromines were added to the List of Toxic Substances (Schedule 1 of CEPA 1999).
- The proposed orders to add Ethylene Oxide, Formaldehyde, and N-Nitrosodimethylamine to the List of Toxic Substances were published in CG I.

Marine Environment Protection or Pollution Prevention

Accomplishments in 2002-2003 included:

- Under the National Programme of Action for the Protection of the Marine Environment, continued to promote pollution prevention and habitat protection in the coastal and marine environments. Some key activities involved the initiation of a re-assessment of the priority ranking for nutrients and the development of national and regional action plans to guide implementation activities for the period 2002-2006.
- Under the Regional Programme of Action (RPA) for the Protection of the Arctic Marine Environment, the Arctic Council's Protection of the Arctic Marine Environment Working Group expanded the RPA to better address land-based activities in the context of sustainable development of the marine coastal environment. As well, Canada confirmed its continued financial and technical support to the implementation of the Russian National Programme of Action GEF project.
- Under the Shellfish Water Quality Protection Program, 16 new shellfish areas were classified and 272 approved sectors of sites were re-evaluated as required under the CSSP. Over 14,000 square kilometers of shellfish growing area are classified as Approved for the direct harvesting of shellfish.

Hazardous waste management

Accomplishments in 2002-2003 included:

- Canada, United-States and Mexico are working under the auspices of the Commission for Environmental Co-operation (CEC) in support of the development a North American Environmentally Sound Management regime to ensure that hazardous wastes and hazardous

recyclables are managed in a way that ensures the protection of human health and the environment.

- In April 2003, Environment Canada (EC) initiated a pilot project with five key Canadian hazardous waste importers and exporters to test the Electronic Data Exchange (EDE) system under real case situations, as well as using Smart Cards as a means to track hazardous wastes and hazardous recyclable materials in real time. In May 2002, Canada became the first country to sign and ratify the United Nations Convention on Persistent Organic Pollutants (POPs). The global agreement (known as the Stockholm Convention) will reduce or eliminate emissions of twelve toxic substances, including PCBs, DDT, and dioxins and furans.

What are the next steps and future challenges?

Environment Canada will continue to be guided by the requirements of CEPA 1999 and the Toxics Management Program. The 2005 mandatory review of CEPA 1999 will provide the Department, other government departments and, other stakeholders the opportunity to review progress to determine if modifications are warranted, and identify opportunities for improvement. Next steps include:

- *Promulgate new Canada-wide standards*. CWS for dioxins and furans for steel manufacturing electric arc furnaces and for iron sintering plants were approved by CCME. CWS for mercury for coal-fired electricity generators will be developed to address increased emissions.
- *Develop or expand innovative instruments for risk management*. In the next year, the Department will release risk management strategies for at least ten toxic substances.
- *Further develop a national hazardous waste management regime*. Working with provinces to develop a national approach, and the U.S. to ensure harmonization of standards, Environment Canada will work towards new/amended regulations that address: PCB waste exports, imports and storage; inter-provincial movement of hazardous wastes; and the import/export of hazardous waste.
- *Further develop the Smart Card Pilot Project.* In co-operation with the U.S. and Mexico, explore opportunities to enhance tracking of transboundary movement of hazardous waste and to improve security at the border by providing real time information for taking effective measures.
- *Implement new tools for compliance*. Budget 2003 funding will support the development of a Compliance and Analysis Planning (CAP) database. The CAP database integrates information on Environment Canada's regulated community for all CEPA and *Fisheries Act* regulations. It will be used to improve Environment Canada's planning and reporting of compliance activities and results. CAP enables Environment Canada to statistically extrapolate the results of planned inspections to the population in order to report on compliance by industry sector, regulation, region and nationally and to be able to monitor compliance trends over time.
- *Improve capacity to extract and integrate data from all databases (NPRI, NAPS, etc.).* This ability will allow the Department to better link environmental results to risk management strategies. Lessons-learned will guide future risk management actions.

4.2 Nature

Strategic Outcome: Conserve biodiversity in healthy ecosystems

Ecosystems are under continuous threat from a number of stressors, such as increased population, industrial activity and unsustainable land use. These activities are leading to increased air and water pollution and the disappearance of habitat required to maintain the natural balance of living things and their environment. Human-induced pressures on biodiversity, including urbanization, agricultural intensification, and resource extraction lead to habitat loss and fragmentation, and continue to result in significant shifts in populations of species of animals and plants, ranging from declines to overabundance. The ability to secure a clean and healthy environment for Canadians is dependent upon our capacity to understand how our ecosystems are affected by human-induced stressors and to transfer that knowledge to Canadians and the global community so that it can be incorporated into decision-making.

Environment Canada acts to conserve the biodiversity and the health of ecosystems by building shared sustainability strategies for Canada's wildlife and ecosystems, contributing to the scientific understanding of ecosystems and developing partnerships to improve the health of nationally significant ecosystems. Within this Business Line, Environment Canada discharges federal responsibilities for managing migratory birds, species at risk, freshwater and wetland resources and also develops the Science and Technology (S&T) policies and practices used throughout the Department.

Within Environment Canada's Management Framework, the Nature Business Line strategic outcome is supported by three key results. Consistent with the structure provided in the departmental Report on Plans and Priorities, we have grouped departmental priority concerns under the key results to which they relate. This logic structure is shown in the table and the narrative performance comments that follow.

STRATEGIC OUTCOME AREA: NATURE				
Key Results:				
Biodiversity		**Ecosystem Health**	**Priority Ecosystems**	
Priority Areas Reported On:				
Species at Risk and Migratory Birds	**Broader Conservation Agenda**	**Ecosystem Health**	**Conservation and protection of water**	**Ecosystem Initiatives**

Nature Business Line

Conserve biodiversity in healthy ecosystems

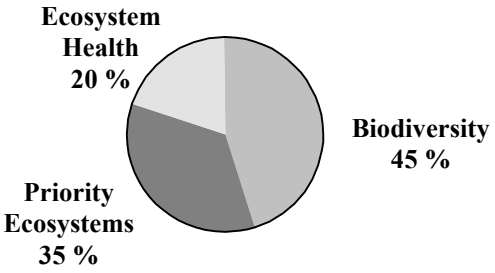
Environment Canada, through the Nature Business Line, aims to achieve three key results:

- conservation of biological diversity;
- understanding and reduction of human impacts on the health of ecosystems; and
- conservation and restoration of priority ecosystems.

Spending by Key Result

(including respendable revenue)

Conservation of biological diversity	$ 69.8 *$ 89.6* **$ 84.2**
Understanding and reduction of human impacts on the health of ecosystems	$ 41.6 *$ 39.8* **$ 37.4**
Conservation and restoration of priority ecosystems	$ 76.6 *$ 69.7* **$ 65.5**
Total for the Business Line	
Planned Spending	$ 188.0
Total Authorities	*$ 199.2*
Actual Spending	**$ 187.1**



Key Partners

An extensive list of partners from all sectors of society by program area can be found in EC's Report on Plans and Priorities 2003-2004 (http://www.ec.gc.ca/rpp/2003/en/a7a.htm#anchor71). Partners relevant to the initiatives reported on in this period have been included in the narrative of this report.

Key Targets and Overall Results

Overall key indicators (as per Section 3 of this report) – biodiversity index (proposed); status of reassessed species; water quality index (proposed); for detailed targets under consideration see EC's Report on Plans and Priorities 2003-2004 (see http://www.ec.gc.ca/rpp/2003/en/a3a.htm#anchor32).

Overall results sought as stated above.

Program, Resources and Results Linkages

Species at Risk — expenditures 2002-2003 - $26.2M

National Water Research Institute–expenditures 2002-2003-$38.2M (expenditures from all Business Lines)

Ecosystem Initiatives — expenditures 2002-2003 - $46.5M.

Management Practices

Ongoing contributions to the horizontal management initiatives of the Department (reported in the Management, Administration and Policy Business Line template).

4.2.1 Key Result: Biological Diversity

Conservation of biological diversity

SPECIES AT RISK AND MIGRATORY BIRDS

What is the issue?

Importance of Nature to Canadians

Leaving a healthy environment for future generations (64%) is the number one issue by which Canadians define what being a Canadian means to them. This feeling is strongest in the Prairies (79%). Women and older Canadians are more likely to state that environmental legacy best defines what being a Canadian means to them.

(Ekos, North American Integration 2002).

Canada is recognized internationally for its natural wealth, including wildlife, forests, water and protected areas. At home, Canada's ecosystems and wildlife are legacy issues for Canadians—a core part of the Canadian identity and an essential resource to be preserved for future generations. Canada's natural resources also have significant economic implications with agriculture, forestry and fishing accounting for almost 14% of GDP, and employing 2.3 million Canadians.

Canada has a key role to play as a steward of natural wealth. Canada is home to over 71,500 known species of wild animals, plants, and other organisms including 200 species of mammals, 400 species of birds, 1,100 species of fish and 4,000 species of plants. From a global perspective, Canada has 20% of the world's remaining wilderness, 24% of its wetlands, 9% of its freshwater, 10% of its forests and the longest coastline in the world. Approximately 8% of Canada's landmass – nearly 80 million hectares – now lies within protected areas.

Despite these resources and Canadians' appreciation of nature, Canada's natural capital is at risk. Human induced pressures are contributing to significant declines in many species of animals and plants. In Canada, 403 species are currently identified as extirpated, endangered, threatened or of special concern. Urbanization, agricultural intensification, forest harvesting and other resource extraction industries are increasingly leading to habitat loss and fragmentation. The long-term effects of acid rain, expanding use of pesticides and other toxic chemicals, and the threat of global climate change exacerbate this situation. Finally, increased international human movement and trade have led to new threats to wildlife and their habitat from introduced diseases and alien invasive species.

What are we doing about it?

Environment Canada discharges the federal government's responsibilities for managing wildlife, particularly migratory birds and species at risk, and their habitats. The Canadian Wildlife Service (CWS) Strategic Plan 2000 sets out the direction and scope of the Department's wildlife and conservation efforts through 2010. The Plan has an overarching goal of biological diversity, with a focus on:

- Protecting species at risk;
- Sustaining migratory bird populations; and
- Protecting and conserving habitats.

Species at Risk

In April 2000, the Minister of the Environment announced the five-year National Strategy for the Protection of Species at Risk. While protecting species at risk is the shared responsibility of all governments in Canada, the Strategy ensures that federal responsibilities are met. The Strategy comprises a number of policy and program areas with Environment Canada, in co-operation with Fisheries and Oceans Canada and Parks Canada, taking the lead on:

- Regional collaboration with the provinces and territories to develop bi-lateral agreements under the federal-provincial-territorial Accord for the Protection of Species at Risks;
- Proclamation and implementation of the *Species at Risk Act*;
- Implementation of the Habitat Stewardship Program (HSP) in collaboration with the provinces and territories; and
- Working to identify and implement recovery processes for species at risk through the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and to implement recovery processes through the Recovery of Nationally Endangered Wildlife (RENEW) Program.

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) has been identifying and monitoring Canadian species at risk since it was established in 1978. In the last year, the Committee has re-organized to continue to bring together Canada's preeminent biological species researchers.

To date, 173 Recovery Plans have been developed for COSEWIC species.

Migratory Birds

The North American Bird Conservation Initiative (NABCI) is a co-ordinated effort among Canada, the United States and Mexico and drives much of CWS's migratory bird activities. The goal of the Initiative is to maintain the diversity and abundance of all North American birds by protecting and restoring their populations and habitats. The Initiative addresses four sub-components that address four bird groups:

- North American Waterfowl Management Plan (NAWMP) for waterfowl;
- Wings Over Water (WOW) for waterbirds and seabirds;
- Canadian Shorebird Conservation Initiative for shorebirds; and
- Partners in Flight (PIF) for landbirds.

Protecting and Conserving Habitat

The Department manages a number of initiatives designed to protect, conserve and rehabilitate habitat significant to migratory birds and species at risk. These stewardship goals are achieved through:

- The Department's protected areas network of Migratory Bird Sanctuaries and National Wildlife Areas;
- Programs that encourage private landowners to protect and maintain habitat for species at risk, including the Habitat Stewardship Program for Species at Risk and the Ecological Gifts Program;
- Facilitating the implementation of Canada's Stewardship Agenda in co-operation with OGDs and the provinces and territories;
- The North American Waterfowl Management Plan (NAWMP), with a goal to restore the waterfowl populations to 1970s levels by conserving wetland and upland habitat; and
- The Department's protected areas network of Migratory Bird Sanctuaries and National Wildlife Areas.

What have we accomplished?

Cumulative performance

Environment Canada's overall approach to the Canadian conservation agenda has been developed with an emphasis on prevention; that is, managing, protecting and conserving habitats to ensure health of ecosystems and all wildlife species.

The Broader Conservation Agenda

The Canadian Biodiversity Strategy (CBS), endorsed in 1996 by the federal, provincial and territorial governments, guides Canada in the implementation of the international Convention on Biological Diversity. The CBS promotes inter-governmental co-operation to advance ecological management.

To meet these goals the Department depends extensively on national, collaborative action. Over the years, CWS has developed strong relationships with United States partners, provinces and territories, and non-government organizations (NGOs). Increasingly, the Department is working with the resource sector to undertake assessments of the impacts on wildlife of industrial and commercial activities and foster sustainable industrial activities.

For example, partners in the NABCI now include the Mining Association of Canada, the Canadian Cattlemen's Association of Canada, and the Forest Products Association. The implementation of species recovery plans, in particular, requires the collaboration of federal, provincial and territorial governments, and the support of many other partners. To date, 282 organizations have financially contributed towards the recovery of 190 species at risk.

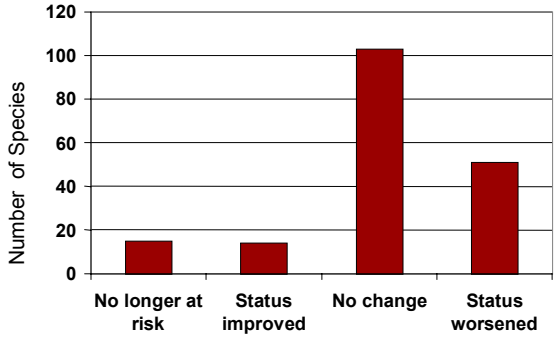
Species at Risk

Canada has committed under the United Nations Convention on Biological Diversity to protecting endangered and threatened wildlife. In 1996, federal, provincial and territorial governments endorsed the Accord for the Protection of Species at Risk, committing each jurisdiction to work together on legislation, programs and policies to protect species at risk in Canada. The federal *Species at Risk Act* (SARA) fulfills a key commitment under the United Nations Convention on Biological Diversity as well as the federal government's commitment under the Accord. In 2003, the federal government committed $33 million over two years for the implementation of SARA. This amount is in addition to the $180 million allocated for the national strategy for species at risk in 2000.

Legislative Agenda

Since 1999, Canada has passed new legislation and strengthened existing environmental and sustainable development legislation. In addition to the *Species at Risk Act*, the Department has contributed to the *Marine Conservation Areas Act*, the *Oceans Act*, the *Pest Control Products Act*, and the *National Parks Act*.

Change in Status of Reassessed Species at Risk, 1985–2003



Notes:

- The data are based on status reassessments conducted by COSEWIC. Reassessments based on existing status reports only were not included. These were re-evaluated using new IUCN criteria and not based on any new information.
- Some downlistings and delistings were as a result of new information gathered rather than a change in the status of the species.
- Species reassessments that result in splitting a species into smaller units (i.e., populations) are considered new assessments.

Source: Committee on the Status of Endangered Wildlife in Canada (COSEWIC), 2003

SARA and related provincial and territorial activities under the Accord present us with a tremendous opportunity to renew the approach to wildlife conservation, to protect and conserve habitat, and to secure new resources to devote to the full range of conservation programming, from science through to operational programs. The Act establishes an arms length scientific species assessment process, a national legal listing process, and prohibitions on killing or harming of listed extirpated, endangered or threatened species and the destruction of their residences and critical habitat. The Act also requires the development of species recovery strategies and action plans and related critical habitat protection measures. With these new legally-binding provisions, the legislation has significant implications for natural resource development, land use planning and conservation decision-making.

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) has been assessing the status of Canadian species at risk since it was established in 1978. With the recent proclamation of SARA, COSEWIC is now established as a legal entity, ensuring that species will continue to be assessed under a rigorous and independent scientific process. The Committee is comprised of members from each provincial and territorial government wildlife agency, four federal organizations (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans and the Federal Biosystematics Partnership, chaired by the Canadian Museum of Nature), three non-jurisdictional members and the co-chairs of the species specialist and the Aboriginal Traditional Knowledge sub-committees. The Committee meets at least once a year to consider status reports on candidate species and to reassess the status of species based on new information.

To date, 173 COSEWIC species have recovery plans or strategies that are in development, in draft or published. To monitor progress, COSEWIC reassesses the status of species to determine trends. A recent assessment (see above Figure) shows improvement in the status of 16% of the 183 species reassessed, compared to the base year of 1985, and no change or a decline in status in the majority of cases. Therefore, while we have established the legal and some program frameworks for species at risk (e.g. recovery plans), achieving on-the-ground results remains a long-term challenge.

Migratory Birds

Protection of migratory birds, with the goal of maintaining healthy populations at acceptable levels, is at the core of the Canadian Wildlife Service (CWS) mandate. Canada's interest in the protection of migratory bird species dates back to the *Migratory Birds Convention Act* (MBCA), signed in 1916 by the United States and Great Britain (on behalf of Canada). The Convention is an example of a highly successful bilateral treaty for the protection of migratory birds, which provided the CWS with its original mandate.

Birds Oiled at Sea
Partnerships and Science in Action

One of the world's busiest shipping routes and one of the nation's most sensitive seabird habitats converge off the southeast coast of Newfoundland and Labrador on Canada's Atlantic coast. More than 30 million seabirds and thousands of ocean-going ships pass through the area each year. It takes just one spot of oil to kill one bird. Scientific studies suggest that more than 300,000 birds - a figure comparable to the toll of the Exxon Valdez spill in Alaska - die each year as a result of ships deliberately dumping a mix of water and oil waste from their engine-room bilge. A partnership approach between Environment Canada, Transport Canada, the Canadian Coast Guard, and Justice Canada, combine efforts on surveillance and enforcement to increase prosecutions, and minimize impacts of oil discharges. This partnership was formalized through a Memorandum of Understanding (MOU) in Atlantic Canada, and will be expanded nationally in the coming year. In a six-month trial period the Canadian Space Agency's cutting edge RADARSAT surveillance technology was tested to determine its effectiveness in detecting oil discharges. Considerable potential found in utilizing this technology lead to the development of a three year national pilot project covering both west and east coasts beginning in 2003-2004.

- For more information, please see the Canadian Wildlife Service's Hinterlands Who's Who entitled *Oiled Pollution and Birds* at: www.cws-scf.ec.gc.ca/hwww-fap.cfm

In recent years, a more integrated approach has been adopted where partnerships with a wide array of organizations are created to meet conservation goals. These partnerships are facilitated through the North American Bird Conservation Initiative (NABCI). NABCI builds on the *Migratory Birds*

Convention Act (MBCA) and other international agreements to deliver on the full spectrum of bird conservation programs through regionally-based, biologically-driven, landscape-oriented partnerships throughout Canada, the United States and Mexico.

Since 1986, there have been no new resources allocated to this program area, while the scope of departmental efforts has expanded significantly. Monitoring efforts show a number of disturbing trends: approximately 35% of landbird species, and roughly two-thirds of the 47 shorebird species, are in decline. Twenty-nine species of birds are on the COSEWIC list of endangered or threatened species. There is a growing sense of urgency to address these downward trends. Environment Canada is now developing a new migratory bird program plan for the Department, in consultation with national and other NABCI partners in the United States and Mexico, that will seek to strengthen the science and information needed for bird conservation, strengthen bird stewardship programs, and improve legislation and its enforcement.

Birds in 2025?

Photo: P. Allen

The prothonotary warbler (above) is one of the many forest bird species in Canada that is under threat from habitat loss.

Source: Setting Canada's Conservation Agenda for the 21st Century

With short-term (1975-2000) trend data appearing to show renewed declines in most regions of Canada, this is no time to be complacent when it comes to bird conservation; in fact, this downward trend suggests additional conservation efforts are required. Where habitat loss is a key factor, recovery is unlikely to occur until habitat protection and restoration efforts increase significantly.

Protecting and Conserving Habitats

Through habitat protection programs and protected areas, the Department works to conserve natural ecosystems, maintain biodiversity and better understand ecosystems and in doing so, protect species at risk and migratory bird populations. Departmental protected areas include national wildlife areas and migratory bird sanctuaries.

Environment Canada maintains 142 National Wildlife Areas (NWA) and Migratory Bird Sanctuaries (MBS). The 11.6 million hectare NWA/MBS system contributes to the conservation of biological diversity in Canada, including species at risk recovery. The Department continues to work closely with other government departments and national non-government organizations (NGOs) on this file.

The Department's Habitat Stewardship Program (HSP) helps to maintain and restore habitat critical to species at risk throughout Canada by encouraging the implementation of conservation projects by community groups, private landowners, First Nations and local governments. The Program was launched in 2000 with a commitment of $45 million over five years. To date, the Program has invested approximately $34 million in 534 projects, leveraging an additional estimated $70 million from project participants, in the form of cash and in-kind contributions.

The Ecological Gifts Program provides income tax incentives to donors of ecologically sensitive land and conservation easements. Since 1995, over 325 eco-gifts have been donated to environmental charities and governments across Canada. The eco-gifts total

more than 24,000 hectares worth more than $67.3 million. Approximately 14% of the gifts so far include habitat for species at risk and over 24% support migratory bird populations. To date, wetland habitats are found on 26% of the lands secured through ecological gifts.

The Department facilitates the work of the federal-provincial-territorial Stewardship Working Group in its support for implementation of Canada's Stewardship Agenda as endorsed by Resource Ministers (Environment Canada, Natural Resource Canada, Fisheries and Ocean, Agriculture Canada and Canadian Heritage) in September 2002. The Agenda supports a key aspect of delivery of the Canadian Biodiversity Strategy. It focuses on several priority actions in particular developing a national stewardship network supported by the Stewardship Canada web portal. The Department has published the Agenda and several supporting initiatives.

- More information about the Stewardship Canada web portal can be found at: www.stewardshipcanada.ca

Each of the above initiatives contributes to habitat conservation and recovery; however it will be necessary to take steps to ensure that overall results are significant at the landscape and ecosystem levels. To this end, the Department will develop an Environment Canada Protected Areas Strategy and will support the development of a federal protected area strategy. (Delayed from 2002-2003 to 2003-2004)

Major performance accomplishments in 2002-2003

Species at Risk

The major milestone of 2002-2003 was reached on December 12, 2002 when the *Species at Risk Act* (SARA) received Royal Assent, bringing to a close a nine-year legislative process. Passage of the Act fulfils a major part of the Government's commitment to protect species at risk and their habitats, and also fulfills Canada's international obligations under the United Nations Convention on Biological Diversity.

> *"SARA is the result of an extensive consultation process that has seldom been seen in Canadian history and the legislation enjoys broad support among Canadians. This inclusive process will continue as the Act provides for openness and transparency at all stages."*
>
> David Anderson, P.C., M.P.
> Minister of the Environment
> December 12, 2002

Other species-at-risk-related accomplishments include:

- In September 2002, the Canadian Endangered Species Conservation Council of Ministers released response statements for 32 species that were designated endangered or threatened by COSEWIC in 2001, along with the COSEWIC Annual Report and the RENEW Annual Report.
- COSEWIC held two species assessment meetings in 2002 and conducted assessments on a number of species. As a result, 16 species were added to the COSEWIC list. The list now includes 415 species, with 142 listed as being of special concern, 99 threatened, 141

endangered, 21 extirpated and 12 extinct. COSEWIC also reassessed 13 endangered and threatened species from Schedule 2 of SARA.

- In addition, discussion continued to advance bi-lateral agreements with Ontario, British Columbia and the Yukon for protection and recovery of species at risk.

Migratory Birds

A draft Canadian Wildlife Service (CWS) Migratory Bird Program Plan (MBPP) is under development in consultation with stakeholders across Canada. Once complete, the next step will be to review and prioritize CWS capabilities in accordance with available resources. Throughout this process, consultation with key North American Bird Conservation Initiative (NABCI) partners will continue.

The following progress has been made on Report on Plans and Priority commitments:

- National or Continental Plans were drafted for each of the four bird groups of the NABCI;
- Demonstration projects were initiated under the NABCI; and
- Inter-agency co-operation on investigation and enforcement initiatives to protect Canada's marine birds from chronic discharges of oily bilge water by ships at sea.

Several HSP projects address two regions in British Columbia, both home to a large number of species at risk and at high risk of losing biological diversity. The South Okanagan-Similkameen Valley is one of the three most endangered ecosystems in Canada with 38 COSEWIC species at risk; the Georgia Basin faces increasing pressure from population growth and is home to over 60 COSEWIC species at risk.

Protecting and Conserving Habitats

Building on the first two years of activity (2000-2001 and 2001-2002), which saw an investment of $15 million in 217 projects, the Habitat Stewardship Program (HSP) allocated nearly $10 million to 153 projects in Year 3 (2002-2003), and $9 million to 164 projects in Year 4 (2003-2004). Projects range from providing a pathway under a highway to give amphibians safe access to another part of their habitat, to including multiple species in comprehensive ecosystem approaches. HSP projects are aligned with other recovery strategies and actions plans.

What are the next steps and future challenges?

The magnitude of the species at risk agenda has resulted in the conservation community devoting considerable attention to this issue. However, concerns about habitat loss, the need for more protected areas in Canada, wildlife diseases and alien invasive species are now moving up on the conservation agenda. Calls to complete Canada's system of national parks and expand the scope of other protected areas networks are intensifying as the general decline in the quality and quantity of the habitat base in Canada becomes increasingly evident. Also, across the conservation agenda, there is a need to develop better tools (e.g. monitoring systems, data sharing) to evaluate how wildlife populations respond to habitat change and to make greater use of innovative incentives and programs (e.g. tax policies, conservation easements) to influence land use planning and decision-making.

Implement the Species at Risks Act (SARA)

As noted above, despite the programs and strategies currently in place, in many instances Canada is not winning the battle to maintain and restore wildlife and their habitats. Implementation of SARA provides an opportunity to improve the way in which conservation programs are designed and delivered, and brings a greater emphasis to monitoring and enforcement that has been lacking in the past. In the upcoming year, Environment Canada will:

- Develop and begin the implementation of the Species at Risk Program Plan;
- Advance negotiations on bilateral agreements with the provinces and territories under the national Accord for the Protection of Species at Risks; and
- Evaluate the success of the Habitat Stewardship Program and continue to align this program with recovery strategies and action plans.

Finalize a new CWS Migratory Bird Plan

Working within the NABCI framework, Environment Canada will:

- Finalize a CWS Migratory Bird Program Plan that lays out a departmental strategy for contributing to bird conservation; and
- Secure agreement among federal departments on co-ordinated investigations and enforcement to protect Canada's marine birds from chronic discharges of oily bilge water by ships at sea.

Addressing Alien Invasive Species

Zebra mussels in the Great Lakes and Purple Loosestrife across the country have been a concern to conservationists for years. More recently, the major economic and ecological impact of a much broader range of alien invasive species has become apparent. At their 2002 meeting, the federal, provincial and territorial ministers responsible for wildlife, fisheries, forests and parks called for a comprehensive national strategy to address the invasives issues, bringing it to the top of the priority lists of most wildlife agencies in Canada.

Expand the Protected Areas Network

Environment Canada will work with other government organizations to develop a Federal Protected Areas and implement the Environment Canada's Protected Areas Strategy;

In addition to the initiative already mentioned, landscape-level pressures on wildlife and wildlife habitat as a result of environmental, social and economic factors will be addressed by furthering initiatives such as a Boreal Strategy. The Department will develop a draft Boreal Strategy that will identify and protect the lands needed to complete protected areas systems and encourage industry (especially forestry, oil and gas) to adopt best practices in the surrounding landscape.

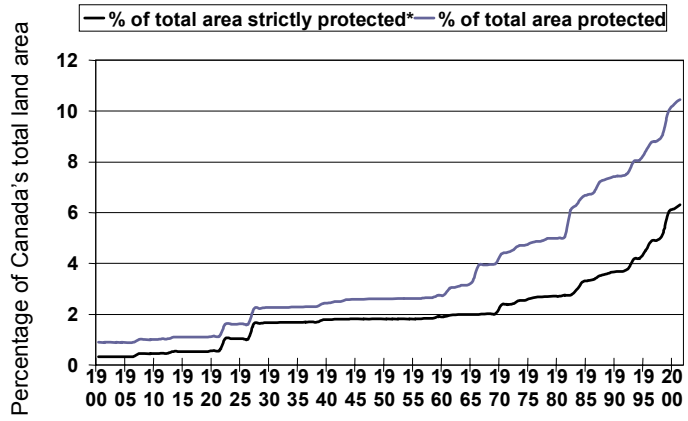
BROADER CONSERVATION AGENDA

What is the issue?

Biological Diversity at Risk

Ecosystems are a way of describing a particular geographic area in order to highlight the inter-related nature of all its parts. Environment Canada recognizes that for conservation strategies to be successful over the longer term, it must integrate the social, economic and environmental factors at play within ecosystems. The Department recognizes that there are obvious advantages to working horizontally with other governments and partners, including information sharing to accomplish this goal.

Total and Strictly Protected Area in Canada



Source: Canadian Wildlife Service, Environment Canada, Canadian Council on Ecological Areas Database, 2003

* Strictly protected areas are equivalent to the World Conservation Union (IUCN) classes I-III and exclude human activities such as forestry, mining and agriculture.

The most significant threat to biodiversity now lies in the loss, degradation and fragmentation of the habitats animals and plants need to survive. Parks and protected areas help protect natural habitats, but they are scattered throughout the country with limited natural linkages between them. Many protected areas are found at high elevations, or on biologically unproductive lands that harbour fewer species than those at lower elevations.

The amount of strictly protected areas has significantly increased from over 36 million hectares to over 61 million hectares from 1992 to 2001. However, this area only equates to 6% of Canada's total land area, half of our national goal of 12 %. Moreover, most protected areas (64%) are smaller than 10 km^2, which is not large enough to sustain many of Canada's larger mammals. It is crucial to species diversity that all of our ecosystems and ecological regions are protected within the 12% goal. Currently, of the 194 terrestrial eco-regions of Canada, only 113 have some strictly protected area, leaving 81 eco-regions with little or no protection.

Beyond the issue of strictly protected areas, urban sprawl has such a large and permanent impact on every aspect of the landscape that, to achieve departmental goals for wildlife and ecosystem protection, a mixed strategy of conservation planning is required. Development is encroaching on parks and protected areas. For every new acre protected, many more are lost to poorly planned development. What is needed is a strategy to foster and support "working landscapes" in which people live, work and play in a manner that uses our natural capital sustainably.

The Need for Integrated Conservation Planning

No single area of society has direct accountability for Canada's natural environment. As a result, an integrated management approach is required. Environment Canada addresses the conservation and sustainable use of Canada's natural ecosystems by fostering close partnership with others. While much progress has been made in implementing actions within all jurisdictions across Canada, much more needs to be done to address a multi-faceted fragmented approach amongst institutions.

Three recent studies have pointed to critical problems in managing biodiversity in Canada today. The World Wildlife Fund Canada (WWF-Canada), Wildlife Habitat Canada (WHC), and the National Round Table on the Environment and the Economy (NRTEE) have all recently concluded that a multiplicity of management approaches and institutional arrangements creates a fragmented, inefficient system for overall management of biodiversity in Canada. Specifically, the WHC reported in the 2001 publication Status of Wildlife Habitats in Canada the following:

"Basic institutional frameworks are outdated and act as barriers. Wildlife habitat management across Canada needs to be integrated. Provincial, territorial, regional and municipal boundaries bear little relationship to Canada's ecosystems or landscapes, limiting the ability of regional conservation programs to address continental or global issues."

WWF-Canada's recent Nature Audit entitled "The Nature Audit – Setting Canada's Conservation Agenda for the 21st Century" also points out that different cultures, different politics, different climates and different land and waterscapes create a country characterized by diversity. The Nature Audit research team found that a lack of information and a lack of access to information were significant barriers to their work. The report concludes by noting that:

"Overall, Canada has made significant commitments to conserve nature, often resulting in the creation of programs, committees and discussions to effect change. In the end, however, we are struggling to turn all of this process into on-the-ground success at the scale of intervention required to adequately respond to the conservation need of the nation."

What are we doing about it?

Today, the Department is actively involved in three areas of broad ecosystems work:

- Working with provincial and territorial partners;

- Implementing a Natural Legacy Agenda for the federal level (consisting of four key areas); and
- Using Ecosystem Initiatives to establish government-community partnerships to address environmental and sustainability issues.

Working with Provincial and Territorial Partners

Canadian Biodiversity Strategy

In Canada, collaborative action in nature and biodiversity is guided by the Canadian Biodiversity Strategy (CBS) which was developed to support the implementation of the United Nations Convention on Biological Diversity ratified by Canada in 1992. The CBS was endorsed by federal, provincial and territorial governments in Canada in 1996 and addresses the difficult issues posed by the loss of biodiversity. It recognizes existing constitutional and legislative responsibilities in Canada, while promoting inter-governmental co-operation to advance ecological management.

- More information about the Strategy can be found at: www.bco.ec.gc.ca/documents/CBS_E.doc

Over the years the CBS has become the umbrella for a range of initiatives including the National Strategy for the Protection of Species at Risk, the *Species at Risk Act*, the Habitat Stewardship Program, and the Ecological Gifts Program. It is also viewed as being the guiding framework for the Nature Business Line and for the Canadian Wildlife Service Strategic Plan. In 2002, Canada completed a national report on the implementation of the Convention ~ Canada's Second National Report to the Conference of the Parties to the Convention on Biological Diversity. Environment Canada played and continues to play, a critical policy co-ordination, catalyzing, and facilitating role in leading national efforts to define Canada's response to the Convention on Biological Diversity.

Working with Resource Ministers

Recognizing the need for an integrated approach, federal, provincial and territorial Forest, Wildlife, Fisheries and Aquaculture Ministers began meeting on an annual basis in 2001. In September 2002, these Ministers renewed their commitment to work together to implement the CBS. They have identified four priorities under the CBS:

- Develop a biodiversity science agenda for Canada including a biological information management component;
- Enhance capacity to monitor and report on the status and trends of biodiversity;
- Address the threat of alien invasive species; and
- Engage Canadians through biodiversity stewardship.

Federal Initiatives under Canada's Natural Legacy Agenda

Natural Legacy Agenda

Through its Natural Legacy Agenda, the federal government is working toward a more integrated approach to protection, conservation and sustainable use of Canada's natural resources. Within the Government of Canada, more than 20 departments have specific mandates for nature conservation; all have a responsibility for sustainable development. The Natural Legacy Agenda is aimed at promoting an integrated resource management approach among all sectors responsible for sustainable natural resource development and land use decisions. This Agenda focuses on several priority areas:

- *Wild Living Resources* – creating a national program plan for protection of species at risk and a plan to address alien invasive species; developing a North American strategy for the protection of migratory birds; renewing of commitment to implement the CBS.
- *Stewardship of Public and Private Lands* – implementing Canada's Stewardship Agenda, including priority actions; developing of a compendium of experiences to date in providing economic and social incentives for stewardship; and conducting other information access initiatives.
- *Protected Areas* - developing a Federal Protected Areas Strategy with Fisheries and Oceans and Parks Canada Agency; and finalizing an Environment Canada Protected Areas Strategy.
- *Science* – creating a nationally integrated environmental monitoring network; developing a distributed biological information management network and co-ordinating mechanism; and developing a federal research strategy to continue to advance understanding of potential effects of genetically modified organism in ecosystems.

Government — Community Partnerships

Ecosystems Initiatives

It is essential to bring key decision-makers (e.g., municipalities and land owners) with their economic and social perspectives, together with those who have environmental concerns in order to develop long-term, effective solutions to ecosystem challenges. Canada's six large Ecosystem Initiatives (EIs) respond to the unique problems of targeted areas and communities and address environmental, economic, and social concerns. The EI's are characterized by a number of principles, including an ecosystem approach — recognizing the interrelationships between land, air, water, wildlife, and human activities. Each EI establishes objectives related to nature and biodiversity.

What have we accomplished?

Cumulative performance

Landscape conservation and the management of ecosystems are not new concepts for Environment Canada. EI's for example, are long-standing co-operative programs that address complex environmental issues affecting targeted ecosystems. They are successful in part because they help Canadians achieve environmental results through partnerships,

pooling resources, focusing science, co-ordinating efforts, sharing information and experiences, and generating a broad basis of support. They also help build the capacity of all players involved to make better decisions and to effect change.

Despite the success of programs such as these, the Department has not fully grounded the concept of Landscape Conservation in the delivery of all of its programs. In fact, detailed discussions on what Environment Canada means by "landscape conservation" are now taking place, and the Department must decide upon the appropriate scope and scale of its approach. There is the full realization that the focus must be on collaborative, horizontally integrated approaches to nature conservation.

Major performance accomplishments in 2002-2003

Canadian Biodiversity Strategy

Ten years after the 1992 Rio Earth Summit there is much to be proud of, within each jurisdiction across the country, in terms of significant progress made in implementing the Convention on Biological Diversity ratified in 1992. At their 2002 joint meeting, federal, provincial and territorial Forest, Wildlife, Fisheries and Aquaculture Ministers noted progress in all four priority areas to be addressed by collective actions:

- Ministers have approved Canada's Stewardship Agenda, which was completed a year ahead of schedule. The Agenda delivers both the national commitment for a Stewardship Strategy under the CBS, and commitments made under the Accord for the Protection of Species at Risk. The Agenda includes eight stewardship principles, four key goals, objectives for each goal and a set of priority actions that recognizes and empowers stewards. In 2003, a national summary report of jurisdictional responses and reports of progress made on the goals, objectives, and actions of the Agenda will be compiled.
- Invasive alien species are those species whose introduction or spread threatens the environment, economy or society (e.g., purple loosestrife, zebra mussels). In September 2002, Ministers approved a blueprint for a national plan to address the threat of invasive alien species. The plan will include a comprehensive review of legislations, policy and program capacity, needs and gaps. Four thematic working groups (aquatic invasive species; terrestrial plants; terrestrial animals; and leadership and co-ordination) will develop the national plan according to the blueprint and present it to Ministers in the fall of 2003.
- Ministers agreed on a set of guiding principles and will establish a national co-ordination mechanism for biological information management.
- Ministers endorsed a plan to develop a Canadian biodiversity index and one window access to status and trends information as the two main elements of a national biodiversity reporting mechanism. The biodiversity index will provide Canadians and decision-makers with clear messages on the state of biodiversity and will allow the aggregation of local assessments into a national index.

The challenge for the future will be to move to more comprehensive delivery of results against goals set and agreed to at the Ministerial level. At this point in time, Environment Canada is in the process of consolidating the overall vision for addressing national issues to guide action on many fronts.

Natural Legacy

Protected Areas

Canada's system of national parks and national marine conservation areas protects valuable natural assets for the enjoyment of current and future generations. This system is currently incomplete. As announced in the September 2002 Speech from the Throne, the government will establish ten new parks and five new marine conservation areas, and implement a plan to restore the ecological health of existing parks. The 2003 budget is providing an investment of $74 million for the first two years. In addition, Canada's Marine Protected Areas (MPAs) system remains among the least developed in the world and lags significantly behind our land-based system. The priority areas that need to be addressed include the following: Bay of Fundy, Gulf of St. Lawrence, the Scotian Shelf and the south coast of British Columbia. In September 2002, at the World Summit on Sustainable Development, Canada and other participating nations committed to completing representative networks of marine protected areas by 2012, and restoring depleted fish stocks by 2015.

Ecosystem Initiatives

Led by the federal, provincial and territorial governments, activities conducted in all EI's during 2002-2003 helped Canadians achieve environmental results. Moreover, the Department helps build the capacity of all the players involved to make better decisions and to effect change. Partners are brought together on an appropriate geographic scale to examine what is happening in an ecosystem and to determine, in a collaborative manner, how best to respond through the implementation of specific programs.

NOTE: Each year the Department profiles one of the EI's in the Departmental Performance Report. This year the Georgia Basin Ecosystem Initiative was renewed as the Georgia Basin Action Plan, this initiative is covered in a separate story (refer to Section 4.2.3 for details).

Northern Ecosystem Initiative

Phase 1 of the Northern Ecosystem Initiative (NEI), completed in 2003, resulted in significant progress in partnership building and successful project implementation across the Canadian North. The Department's investment of $4.5 million over 5 years leveraged an additional estimated $10M from partners, for a total investment of $14.5M, representing the single largest new investment by Environment Canada and partners directly into the northern capacity building and northern science in the past decade. Phase II, with an emphasis on climate change, monitoring, partner-capacity building and measuring ecosystem results, will result in generation and application of knowledge at an ecosystem and community level to address environmental challenges in the North.

What are the next steps and future challenges?

Working in co-ordinated, effective partnerships to deliver results will continue to be the most challenging aspect of managing broader ecosystems initiatives. While the Canadian Biodiversity Strategy (CBS) provides the overarching vision of the future, and the new Stewardship Agenda provides integrating guidance, there is much to be done to address

current fragmentation in terms of overall coordination and management of broad ecosystems initiatives across Canada.

In the days ahead the Department will be looking for ways to integrate ideas and suggestions from its partners including responding to recent reports from the NRTEE, WHC and WWF-Canada.

Several upcoming activities under broader ecosystem strategies are as follows:

Canadian Biodiversity Strategy

As plans and actions under the Canadian Biodiversity Strategy moves Environment Canada from a planning phase to implementation, it is expected that funding pressures may arise when activities (e.g. implementation of the Biological Information Management Strategy, biodiversity science agenda, invasive alien species plan etc.) are launched. Environment Canada will:

- Develop a biodiversity science agenda including proposals for a biological information management co-ordinating mechanism;
- Refine draft framework for Canadian biodiverisity index through pilot testing and create a one window access to status and trends information as two elements of a national biodiversity reporting systems; and
- Continue consultations with government and non-government stakeholders to finalize the draft plan on invasive alien species by fall 2004.

Protected Areas

- Complete Environment Canada's Protected Areas Strategy, and work with other key departments to develop a federal protected areas strategy; and
- Create Canadian Forces Base (CFB) Suffield National Wildlife Area under the National Wildlife Area Regulations.

Stewardship

- Develop progress reports on priority actions under Canada's Stewardship Agenda;
- Continue to implement the Ecological Gifts Program, including implementing enhanced income tax incentives in 2003, conduct an evaluation of Ecological Gifts Program, and secure new resources for program continuation in 2003-2004 and onwards; and
- Ensure the 2003 Update to the North American Waterfowl Management Plan is completed, signed by Canada, the United States and Mexico, and implemented in Canada.

4.2.2 Key Result: Health of Ecosystems

Understanding and reductions of human impacts on the health of ecosystems

ECOSYSTEM HEALTH

What is the issue?

The ability to secure a clean and healthy environment for Canadians is dependent upon our capacity to understand how ecosystems are affected by human-induced stressors and to transfer such knowledge to Canadians and the global community. Only then can it be incorporated into effective decision-making. An understanding of ecosystem structure, processes and functions, as well as the effects of economic activities, are critical requirements for effective ecosystems-based management.

What are we doing about it?

Environment Canada's focus in the ecosystem health priority area is to:

- Determine "*what is changing*" within ecosystems - ensure that Canadians receive timely information and advice on the status and trends of the health of ecosystems;
- Assess "*why things are happening / changing*" - advance the scientific understanding of the impacts of human activities on the health of ecosystems;
- Determine "*what we can do about it*" - provide science-based advice and solutions that contribute to reducing human impacts on the health of ecosystems; and
- "*Ensure excellence in managing science and technology*" (S&T) - ensure strategic management of Environment Canada's S&T is in alignment with federal S&T policy.

Environment Canada works in collaboration with other federal departments, provinces and territories [(e.g., individually or through the Canadian Council of Ministers of the Environment (CCME)], science networks related to work on the environment [eg. Social Sciences and Humanities Research Council (SSHRC), National Science and Engineering Research Council (NSERC) and Canadians Institutes of Health Research (CIHR)], as well as the public (including ENGOs and academia) to share information, determine priorities for monitoring and research, and provide timely and integrated information and advice to decision makers.

The Department has two over-arching priorities in the ecosystem health area:

- Enhance environmental quality status and trends monitoring and reporting; and
- Advance scientific understanding of the effects of human activities on the health of ecosystems.

What have we accomplished?

Determining "What is changing"

Monitoring Related Research and Reporting

Environmental monitoring is a cornerstone in detecting and tracking ecosystem changes. To strategically support our mission, monitoring should be able to provide both comprehensive information on ecosystem status and trends, and early detection of ecosystem change as a basis for preventive action. It is equally important that monitoring is based on consistent, meaningful and ecologically relevant indicators of this change so that results can be interpreted, compared and communicated in terms of their significance to ecosystem health.

To achieve this sub-result, Environment Canada is leading work in this area, in collaboration with many partners, to:

- Design and implement a system for assessing and reporting ecosystem status and trends that tracks, measures and describes ecosystem response to environmental stressors and provides early detection of significant new stressors (water quality is a key focus in the short term);
- Foster innovative research and enhance predictive capacity in detecting new, emerging (eg. endocrine disrupting substances) or poorly understood stressors (eg. in-use pesticides, cumulative stresses); and
- Provide regular reporting on ecosystem status and trends to inform and advise scientists, government and the public on ecosystem change and to raise awareness of the potential importance of that change.

Mercury — Fishing for Answers

Mercury, and particularly a form of it called methylmercury, is a human and environmental health concern because of its toxicity and ability to accumulate in fish and wildlife. Mercury levels in fish are high enough to put wildlife such as loons, kingfishers, herons, osprey and mink at risk of adverse health effects. In general, little is known about the levels of mercury in fish eaten by wildlife. The management of mercury in the environment is a priority for the federal, provincial and territorial governments in Canada. Many initiatives are currently in place to curb emissions. Improved monitoring of mercury levels in fish eaten by wildlife is needed to explain the observed effects in wildlife, to forecast future problems, and to evaluate the efficacy of pollution control measures taken to reduce mercury in the environment.

- For more information see: www.ec.gc.ca/ceqg-rcqe/english/html/mercury/index.cfm

Environment Canada has adopted a "network of networks" approach to integrate the monitoring results from various sources. Over the last several years federal departments, provinces and territories and others have been collecting information on ecosystems in very different ways. The Department's current challenge is one of creating a coherent national picture by reviewing outputs from each part of the country. Through the Canadian Information System for the Environment (CISE), a data referencing network is being set up to provide an overview of monitoring data across Canada. While a national picture has not yet been established, efforts are well underway in the design of this new program. In collaboration with CCME the Department is developing a set of integrative tools to provide a national snapshot.

Recent developments in this area include:

- A CCME-sponsored experts workshop held in October 2002 to facilitate a national dialogue on Canadian water quality monitoring and share information on the current state of the science, technology and best practices in this area as supported by Environment Canada.

  - For more information see: www.ccme.ca/assets/pdf/monitoring_workshop_current_state_eng.pdf

- A Water Quality Index (WQI) pilot study report for the Atlantic Provinces is nearing completion. The WQI is a means to summarize large amounts of water quality data into simple terms (e.g., good or fair) for reporting to management and the general public on whether the overall quality of water bodies poses a potential threat to various beneficial uses of water; and
- A report entitled "Mercury: Fishing for Answers" was published. This report gives an overview of mercury in Canada and discusses levels of mercury in fish that could be detrimental to wildlife.

Citizen-Based Monitoring

Individual programs are being implemented to conduct a variety of citizen-based monitoring activities. The Ecological Monitoring and Assessment Network (EMAN) is made up of organizations and individuals involved in ecological monitoring in Canada (including all levels of government, academia, aboriginal communities, the private sector, the volunteer community, schools and other ecological groups) to better detect, describe, and report on ecosystem changes. Environment Canada's Ecological Monitoring and Assessment Network Coordinating Office (EMAN CO) brings together those with common interests in ecological monitoring and research for the purpose of developing common techniques and protocols, promoting the sharing of data and information through metadata and, attempting to catalyse the production of integrated reports and information. "NatureWatch" is a suite of community-based "citizen science" monitoring programs including "FrogWatch", "WormWatch", "IceWatch" and "PlantWatch".

- For more information see: www.eman-rese.ca/eman/naturewatch.html

A pilot project to develop a standardized approach to community-based monitoring in Canada was initiated by EMAN CO and the Canadian Nature Federation (CNF) with funding from the Voluntary Sector Initiative (VSI). The website that was created describes the results of the project and provides a toolbox of helpful methods and resources, as well as lessons learned and keys for success to support communities in implementing their monitoring program.

- For more information see: www.ccmn.ca/english

Development of Indicators

Environmental indicators provide an effective means by which complex environmental data can be transformed into easy-to-use communication and decision-making tools. Canada began developing a national set of environmental indicators over 10 years ago to

establish a comprehensive basis for measuring the state of the environment and the relationship between the environment and economic development. At present, environmental indicator programs are now in place throughout Canada and internationally.

The challenge is to bring together many of these indicator initiatives to provide a cohesive national picture of environmental sustainability. In this regard, Environment Canada is working with other organizations to develop a more comprehensive and improved set of national indicators — a single, recognizable set that makes use of the soundest approaches from all jurisdictions. Through renewed attention to organizing environmental knowledge, gaps will be filled, and better ways of communicating information will emerge.

As a starting point for the development of this more complete set of indicators, Environment Canada has consolidated all indicators presented in the National Environmental Indicator Series in a recent report entitled "Environmental Signals: Canada's National Environmental Indicator Series 2003". This provides a broad picture of the current state of Canada's environment, as well as linkages between issue areas.

This effort is supported by a broad range of complementary environmental indicator and state of the environment (SOE) reporting at Environment Canada as well as a recent initiative to develop a national environmental indicator and SOE reporting strategy which is designed to provide greater cohesion and direction to indicator and reporting activities, first within Environment Canada and then with other levels of government.

The Environmental Signals: Canada's National Environmental Indicator Series 2003 and its companion report, Headline Indicators, contains a set of 14 key indicators that are intended to provide a broad overview of trends in Canada's environment in areas that are important to Canadians.

Ecological Life-support Systems Indicators:	**Human Health and Well-being Indicators:**	**Natural Resources Sustainability Indicators:**
▪ Biodiversity and protected areas ▪ Toxic substances ▪ Acid rain ▪ Climate change ▪ Stratospheric ozone	▪ Municipal water use ▪ Municipal wastewater treatment ▪ Urban air quality	▪ Forestry ▪ Agricultural soils **Human Activities Indicators:** ▪ Energy consumption ▪ Passenger transportation ▪ Municipal solid waste

The Environmental Signals reports that over the past ten years some improvements have been observed in the acidity levels of 40% of monitored lakes while ambient concentrations of air pollutants have dropped in some urban areas. Canadians have made efforts to tread more lightly on the environment. Decreases have been observed in some toxic emissions, for instance, in the use of stratospheric ozone-depleting substances and in the per capita energy consumption. Increases have been observed in the percentage of Canada's protected land base and in the use of advanced wastewater treatment. However, many challenges remain. Air quality has deteriorated in some urban areas, as has water

quality in some lakes affected by acidification. Greenhouse gas emissions, municipal water use, waste disposed and the use of energy inefficient vehicles have also increased.

- For more information see: www.ec.gc.ca/soer-ree

Environment Canada has been providing input and other support to the Environment and Sustainable Development Indicators (ESDI) initiative of the National Round Table on the Environment and the Economy (NRTEE), including development and implementation of the initiative's freshwater indicator. In its final report, the NRTEE recommended to the Minister of Finance that Environment Canada and Statistics Canada establish national-level indicators and information systems that track the impact of current economic practices on the natural and human assets that will be needed by future generations of Canadians. Work is also proceeding on a multi-year project to develop a Canadian Biodiversity Index. This effort is being led by the federal/provincial/territorial Biodiversity Working Group of the Canadian Wildlife Ministers. A first draft of a Framework for the Index has been completed and is ready for proof of concept testing.

Assessing "Why things are changing"

After specific changes within ecosystems have been identified through the "What is changing" activities noted above, the challenge becomes one of conducting relevant research activities to assess "Why" such changes are occurring, and to transfer this knowledge to decision-makers who can take action to address ecosystem issues. In other words, the objective is research to determine the cause-effect relationship between human activities and their impacts on the ecosystem health and to disseminate this information in appropriate forms to various clients and partners.

Conducting Research

As an overarching approach, Environment Canada works with the broader environmental science community to build mechanisms to enhance the effectiveness and efficiency of environmental research through networking and partnership activities. The Canadian Environmental Sciences Network (CESN) aims to evolve into a "network of networks", providing a new horizontal management framework across its membership of research-oriented organizations. In the past year, existing networks are moving ahead, developing thematic co-operatives, establishing common priorities and research agendas, and assessing environmental research capacities. Within the context of this broader agenda, the Department has been developing new knowledge related to ecosystem health (e.g. municipal wastewater treatment, water reuse and recycling, a cumulative effects framework for river ecosystems, and levels and trends of PBDEs) and more detailed research strategies for emerging issues (e.g., pharmaceuticals and personal care products and genetically modified organisms). Organizations that contribute to the research agenda, such as the National Water Research Institute (NWRI) assess the relevancy of projects every few years relative to Nature Business Line priorities. Over the planning period, NWRI initiated regional expansion of its programs by establishing the national

program leads of NWRI's Climate Change Impacts Project at the University of Victoria and the Cumulative Impacts Project at the University of New Brunswick.

A key activity within the Department's research agenda is the communication of the findings of research to decision-makers. In this regard, Environment Canada provides expert advice to key committees such as the CCME to support broad collaborative efforts at a national level. Last year, significant CCME science-policy workshops were held in conjunction with Environment Canada on various topics such as the effects of agricultural activity on water quality; groundwater quality; and water reuse and recycling. Two reports were published and a third is nearing completion.

- For more information, please visit: www.nwri.ca/publications/keyreport-e.html

Conducting Science Assessments

Science assessments focus on creating, reviewing, interpreting and synthesizing scientific knowledge on critical and emerging environmental issues. These assessments are the principal means by which answers to the question "Why are ecosystems changing?" is communicated to the science community and decision-makers. Last year, science assessments were completed on a science assessment of Threats to Sources of Drinking Water and Aquatic Ecosystem Health in Canada; National Assessment of Pulp and Paper Cycle 2 Environmental Effects Monitoring (EEM); Clean-up Activities in Hamilton Harbour; and the Fate of Organic Matter in Eastern Lake Erie.

Assessment and Management of Pharmaceuticals and Personal Care Products in the Canadian Environment: Proceedings of a Multi-Stakeholder Workshop

Recent studies in Europe and the United States have documented the presence of a wide variety of substances contained in pharmaceuticals and personal care products (PPCPs) in the environment. Municipal sewage, agricultural and aquaculture wastes have been identified as sources of PPCPs such as antibiotics, blood lipid regulators, analgesics, anti-inflammatories, antiepileptics, natural and synthetic hormones, fragrances (musks), nonylphenol ethoxylates, disinfectants and antiparasiticides. There is mounting evidence that some of these chemicals have the potential to induce adverse health effects in non-target species and possibly humans when exposed to low levels. Effects of concern include disruption of development and reproduction in exposed individuals and their offspring, as well as the enhancement of antibiotic resistant bacteria. There is great uncertainty what the potential long-term human health and ecological health consequences may be resulting from continuous low-level exposure to these substances, especially in sensitive life stages and populations. A scientific workshop on this subject was held in February 2002. This multi-stakeholder workshop (with scientists from the EU, US and Canada as well as representatives from industry, government academia and public interest groups) sponsored by Health Canada and Environment Canada provided a forum to discuss PPCPs within a Canadian and international perspective. The workshop resulted in the identification of major research priorities and risk management needs in Canada.

- For more information see: www.nwri.ca/research/pharmaceuticals-e.html

Determining "What we can do about it"

Based upon the key learnings from research, Environment Canada develops science-based solutions and science-based benchmarks, and disseminates a vast array of tools, guidelines and science-based solutions for taking corrective and/or preventive actions. Efforts focus on determining whether or not the change in the state of ecosystems is due to the effects of human activities; and on determining the nature and extent of the relationship between human activities and ecosystem health. Most of the work undertaken in this area relates to water quality.

Environment Canada works with federal, provincial and territorial partners to investigate opportunities for enhancing and accelerating the development of national guidelines for water quality. Last year, technical supporting documents and fact sheets were completed to support the development of environmental quality standards for the following areas: water - nonylphenol (water, sediment); nitrates; site specific objectives guidelines document; fluorides; sediment assessment framework; a water quality index report; soil – nonylphenol; and selenium.

Environment Canada also seeks to advance Environmental Effects Monitoring (EEM) through the release of significant assessments and through continued exploration of EEM applications in various sectors. Last year, two reports on pulp and paper cycle results were published, entitled the "National Assessment of Pulp and Paper Environment Effects Monitoring Data" (full report) and a Report Synopsis. A Scoping Assessment of the Impacts of Freshwater Aquaculture on the Canadian Environment was completed. Finally, a workshop was held to consult on an Environmental Quality Objectives framework that could potentially be used to help manage effluents released from wastewater systems.

National Assessment of Pulp and Paper Monitoring Data

In 1992, the federal government passed the Pulp and Paper Regulatory Framework consisting of the Pulp and Paper Effluent Regulations (PPER) under the *Fisheries Act* and two regulations under the *Canadian Environmental Protection Act*. It was recognized that these measures alone might not ensure adequate protection of the aquatic ecosystem at every site. Consequently, the PPER included a requirement for an Environmental Effects Monitoring (EEM) program to provide an overview of the state of receiving environments around pulp and paper mills across Canada. As a result of the regulatory framework, most pulp and paper mills in Canada are equipped with at least primary and secondary treatment systems. Although mills have been successful in dramatically reducing the toxicity of their effluents, EEM data show that mills continue to have an impact on fish and their habitat (as measured by the benthic invertebrate community survey). More monitoring is needed to assess the spatial extent and ecological importance of the observed effects, and Environment Canada will continue to work with industry and other stakeholders to better understand their importance. These results are an excellent starting point and underline the importance of continued EEM.

- For more information see: www.nwri.ca/synopsis/intro-e.html

Ensuring excellence in managing Science and Technology (S&T)

Through the development of policies and practices for improving its management of S&T, Environment Canada is advancing the following goals: strengthening environmental science and technology; integrating efforts across disciplines, departments, and other S&T performers; and focussing on the priorities of Canadians. Excellence in environmental S&T is the foundation for dealing with the environmental challenges facing Canadians, and as such it is critical for the success of Environment Canada. Science policy services are provided to managers in the Department as well as to interdepartmental initiatives. Main accomplishments in 2002-2003 included the following:

- The implementation of measures of the Federal Science Advice Framework were met. The Department also led an inter-departmental initiative that developed common tools to aid implementation including a science advice checklist for Cabinet documents, a guide for science and policy managers, and a training course.
- The Deputy Minister's S&T Advisory Board offered useful advice to the Department, in particular with regard to providing recommendations on how the Department should address the ecosystem effects of genetically modified organisms.
- A web-based directory of expertise in the Department, (EC XPERT), was developed. This will be implemented in the coming year.
- The Department was strongly involved in planning, implementation and follow-up activities related to the successful Federal S&T Forum. An important output of this Forum was a Vision for Federal S&T.

What are the next steps and future challenges?

Priorities for the planning period for the four sub-results of the Ecosystem Health Result are:

Determining "What is changing"

- Produce Ecosystem Status and Trends Reports, and State of the Environment Reports, e.g., Water Quality Index in Atlantic Provinces and nationally through the National Round Table on the Environment and the Economy (NRTEE); metals in wildlife;
- Develop new indicators and improve on existing indicators in areas such as biodiversity, emissions and effects of toxic chemicals, water quality and air quality;
- Strengthen commitment to better link water quality monitoring networks nationally through the development of a Canada-wide framework on water quality monitoring under the CCME; and
- Focus water quality information on priority areas of national importance such as improved surveillance on pesticides in Canadian aquatic ecosystems.

Assessing "Why things are changing"

- Enhance scientific research by strengthening the role of the NWRI through expansion of the

NWRI mandate, (e.g., rebuilding the capacity for microbiological water quality research and wastewater management research);

- Develop a federal research strategy to address the effects of genetically-modified organisms on ecosystems;
- Conduct and publish science assessments on key environmental issues (e.g. taste and odour in drinking water sources, contaminated sediments, phosphorus freshwater systems, and freshwater aquaculture); and
- Transfer new knowledge and linking water science to policy on the degradation and protection of Canada's groundwater, as well as its impact on private and public drinking water, aquatic ecosystems, and surface waters to policy; assess effects of agricultural activities on water quality; groundwater quality; and water re-use and re-cycling.

Determining "What we can do about it"

- Review and explore, with federal, provincial and territorial partners, new management tools for agriculture and aquaculture through the development of a phosphorus ecozone environmental quality guideline, nitrate guideline, and three priority pesticide guidelines;
- Produce environmental quality guidelines for diisopropanolamine, sulpholane, aluminum, and uranium, and updating of water guideline protocols for metals and safety factors and complete science assessment of climate change on Arctic freshwater ecosystems for the Arctic Climate Impact Assessment and initiate the national science assessment of ecosystem effects on climate change;
- Develop a suite of biocriteria aimed at the municipal waste water sector and promoting these for national approval through the CCME. In addition, site-specific objectives reports for ammonia and chloramines to assist the sector will be made available;
- Through collaboration with the Federal/Provincial/Territorial Drinking Water Committee, pursue the development of a source water guideline for turbidity to assist water managers with their implementation of watershed/aquifer management plans;
- Develop agri-environmental standards under the Agriculture Policy Framework for use in the management of impacts on air, water, soil and biodiversity stemming from the agricultural sector;
- Develop guidance for the municipal water sector through the development of a site-specific guidance document on implementing guidelines or objectives for substances not captured by minimum treatment standards; and
- Advance EEM through the implementation of Metal Mining EEM program; and explore application of EEM to other sectors, (e.g., aquaculture and municipal wastewater).

Ensuring excellence in managing science and technology

- Develop new mechanisms and strengthen existing ones to better integrate federal S&T and link it with external S&T (e.g., ecosystem effects of GMOs); and
- Promote the establishment of a Canadian Environmental Sciences Network, as well as regional and issue-specific networks (eg. facilitate and assist in the development of water quality science capacity in the Prairie and Northern Region; leadership on regional watershed initiatives; Bow Council, Sask Partners, Red River, etc., build cooperative opportunities with First Nations, and Co-management Boards).

4.2.3 Key Result: Priority Ecosystems

Conservation and restoration of priority ecosystems

WATER INITIATIVES

What is the issue?

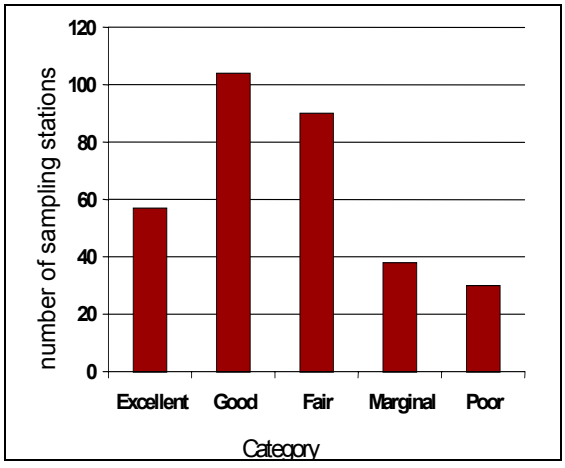
Clean, safe and secure water for Canadians and the ecosystem continues to be a growing issue of public concern on both the national and international agenda.

Water quality is influenced by a wide variety of contaminants. The importance and severity of contamination is greatly dependent on environmental context. Protecting water sources from pollution is a key factor to minimizing the risks of both contamination to water supplies and damage to aquatic ecosystems. Currently, there is no comprehensive national network for water quality monitoring, making it difficult to pinpoint changes in water quality and the causes of such changes.In Canada, over the past few years the incidents in Walkerton, Ontario and North Battleford, along with subsequent public inquiries and reports have raised expectations related to actions needed to address water quality issues. The Walkerton reports made management recommendations relevant to all jurisdictions, and referenced federal roles in developing drinking water guidelines and in assuring water quality on federal lands (including First Nations communities). Source water protection, in which the federal government plays a key role, was also highlighted.

Water Quality Indices

A first approximation for a national picture of ambient freshwater quality in Canada has been developed with a pilot study that calculates Water Quality Index values. The water bodies sampled for this study tend to be concentrated in the more populated areas of the country where the potential threats to water quality are generally greatest. Although the results from this study are not an absolute picture of Canadian freshwater quality, the results are promising, with the majority of stations sampled falling under the categories of Excellent, Good or Fair.

Water quality of monitoring stations across Canada 2002-2003



Source: National Round Table for the Environment and the Economy, *Environment and Sustainable Development Indicators.*

In addition to concerns about the quality of water, long-term **water quantity, sustainability and adaptation to extreme events** need to be addressed on an

ongoing basis. These include concerns such as changing water levels in the Great Lakes and St. Lawrence River, issues about bulk water removals, the impact of climate change, hazard management issues and contamination - all issues of public interest. The long-term security of water supply is also a challenging issue, given the high rate of per capita consumption (second highest in developed countries), and the geographic and demographic trends in Canada.

Globally, water issues have been raised at the World Summit on Sustainable Development (WSSD - Johannesburg, 2002), at the 3rd World Water Forum (Kyoto, 2003), and in the Millennium Development Goals that were established at the Millennium Summit (New York, 2000). Water continues to be a key item on the agenda of G-8 leaders.

What are we doing about it?

Responsibility for the management of freshwater is shared among governments, industry and individual Canadians. Provinces and territories have primary jurisdiction over most areas of water management and protection, and most governments delegate some of these authorities to municipalities. Federal jurisdiction applies to conservation and protection of oceans and their resources, fisheries, navigation, shipping, and international relations and agreements. The federal government is also responsible for water on federal lands including territories, parks and First Nations communities. Although not expressly stated in the Constitution, the federal government plays a lead role in water science and monitoring supporting water management by all jurisdictions.

At least nine pieces of federal legislation establish a host of responsibilities for the federal management of fresh water. A number of agreements, policies, and programs further articulate those responsibilities.

Great Lakes Basin Ecosystem Initiative – A Focus on Partnerships

The Great Lakes are a tremendous natural resource shared between Canada and the United States. In the past 30 years, since the signing of the Great Lakes Water Quality Agreement, many remarkable achievements have been made in restoring the health of the ecosystem.

The Great Lakes Basin Ecosystem Initiative incorporates the actions of eight Government of Canada departments, joint Canada-Ontario activities, and actions undertaken in coordination and cooperation with United States federal and state agencies. Together they have established a shared vision of a healthy, prosperous and sustainable Great Lakes Basin.

The shared vision between Canada and the United States has lead to effective bi-national co-operation and ensured that both countries are rowing in the same direction and striving for the same outcome. The Bi-national Executive Committee plays a large role in securing the engagement of all stakeholders by setting strategic direction and plans.

Through continued co-operative efforts, partnerships have broadened between all levels of government, industry, business, aboriginal peoples, interest groups, and the thirty five million Great Lakes Basin residents on both sides of the border. These partnerships have been critical to the successes achieved to date.

For us to truly succeed in the long term goal of restoring the Great Lakes we must continue to engage all partners and work collectively towards a common bi-national vision – "to restore and maintain the chemical, physical and biological integrity of the Great Lakes Basin Ecosystem".

- Under the *Canada Water Act*, the Minister of the Environment can enter agreements with provincial governments to restore and protect water bodies of national interest. The Act also authorizes the Minister in co-operation

with provinces, to undertake research and collect data to develop comprehensive management plans for nationally significant waters.

- Provisions of the *Fisheries Act* prohibit the discharge of harmful substances into waters used by fish. The *Canadian Environmental Protection Act*, administered by Environment Canada and Health Canada, mandates the federal government to protect the environment and human health from the use and release of toxic substances, pollutants, and wastes.

Northern Rivers Ecosystem Initiative

The Department also brought the Northern Rivers Ecosystem Initiative (NREI) to a successful close in 2003, with the culmination of 11 years of research, and meeting its objectives in following up the Northern River Basin Study recommendations. Final report will be released in 2003

- International treaties, such as the Great Lakes Water Quality Agreement between Canada and the U.S., establish specific obligations, as do federal government agreements with various provincial governments.
- The Federal Water Policy, adopted in 1987, encourages efficient and equitable use of fresh water in a way that can meet the social, economic, and environmental needs of present and future generations. The policy establishes goals and strategies for water management, and a series of commitments.

Within the framework of this complexity, Environment Canada addresses critical water issues on a number of fronts:

- *International* – International efforts reinforce Canada's contribution to addressing global water issues identified at major world summits noted above (WSSD, 3rd World Water Forum, Millennium Summit), drawing on the Department's strengths in science, information, partnerships and governance. Also, the Department continues to build consensus on Canada-U.S. transboundary water issues.
- *National* – The Canadian Council of Ministers of the Environment (CCME) is the forum for facilitating federal, provincial and territorial collaboration on environmental priorities of national concern. Through the CCME, Environment Canada works with provincial and territorial counterparts with a focus on water quality and environmental and drinking water standards based on sound science. The Department is a major contributor of scientific research into the impacts of human activities on water quality, and more generally, on ecosystem health.
- *Federal* – Environment Canada facilitates federal collaboration on cross-cutting issues to ensure a coordinated and effective approach, and to provide leadership to ensure appropriate science and action for water on federal lands.
- *Department* – A co-ordinated strategy governing a wide range of initiatives within Environment Canada has been developed. The Department also actively carries out its roles in administering relevant legislation, monitoring, science, guidelines development, management of issues related to water on federal properties and international relations.

What have we accomplished?

Cumulative Performance

Environment Canada has been actively engaged in water-related issues, leading and participating in initiatives at home and abroad to support the long-term goal of clean, safe

and secure water for Canadians and ecosystems. In addition to dealing with immediate issues at hand, including the discharge of legislative responsibilities, progress has been made in developing frameworks for internal co-ordination of effort, in establishing a basis for shared governance with other levels of government, and in collaborating with others to ensure long-term success.

There has been significant progress over the past few years in terms of effective collective engagement at all four levels in which departmental efforts are undertaken – international, national, federal, and departmental. There is a continuing need, however, for more concerted effort at each level in order to better integrate strategies, plans and initiatives as we move into the future.

Major Specific Accomplishments in 2002-2003

Science and Monitoring

In 2002, under the leadership of Environment Canada's National Water Research Institute (NWRI), a Federal Water Research Network was launched to co-ordinate federal water science activities. To date the network has established seven priority areas for collaboration in support of four long-term outcomes: protection of human health; protection of aquatic biodiversity and ecosystem health; sustainable use of aquatic resources; and protection from water-based hazards and extreme events.

Through science assessments, the Department works with others to identify key pressures to both water quality and quantity. The NWRI has organized two workshops (one in each of 2001 and 2002 fiscal years) to synthesize the science effort related to threats to water quality and water availability. During these workshops, key issues, critical questions and challenges facing researchers and governments in these areas were identified.

Modelling the St. Lawrence Freshwater Ecosystem

Environment Canada and Environment Quebec researchers are developing a model to describe the dynamics and ecosystem behaviour of the freshwater section of the St. Lawrence River.

The program focuses on the quantitative analysis of the impacts of flow and water level variations on the physical, chemical, biological and socio-economic characteristics of the St. Lawrence River ecosystem. Changes in current speed, hydraulic retention and flooded areas will be evaluated using a hydrodynamic model in which shoreline erosion and the transportation of contaminants could one day be incorporated. The biological impacts include changes to wetlands (area, productivity and diversity) and the recruitment and growth of fish and waterfowl. Water level variations can also potentially affect exotic species and parasites, as well as a large number of recreational activities taking place along the banks of the river.

This work will provide us with a better understanding of the effects of such water-level fluctuations and thus help us improve management methods.

The conclusions from the 2001 workshop on threats to water quality provided the basis for subsequent planning and implementation of a series of research/policy workshops sponsored by the CCME on the following themes: Agricultural Impacts on Water Quality; Groundwater Quality; and Water Reuse and Recycling. Workshops were held on certification and training (September 2002) and on water monitoring (October 2002).

Next steps include the development of implementation tools and a technical reference document (science, standards, training, emergency plans), public education and enhanced collaboration among sectors.

Identification of key challenges faced in the area of water quality and quantity is serving to set priorities for the federal government, and to stimulate collaborative effort through the CCME.

Governance

The Department is pursuing the broader application of the Integrated Water Resources Management (IWRM) concept and its adoption both domestically and globally. IWRM advocates co-ordinated development and management of water resources in order to maximize economic and social benefits without compromising the sustainability of vital ecosystems. There are many different governance models for implementing IWRN. The Department has been involved in early model initiatives for this approach, through work with both the Fraser Basin Council and the Prairie Provinces Water Board.

Prairie Provinces Water Board

The ownership of the waters of a river system flowing through several jurisdictions can give rise to many administrative and water use problems. To resolve conflicts between upstream uses and downstream needs, Alberta, Saskatchewan, Manitoba and Canada signed the Master Agreement on Apportionment in 1969.

The mandate of the Prairie Provinces Water Board is to ensure eastward flowing interprovincial streams are, in accordance with the provisions of that Agreement, shared equitably, that water quality at interprovincial boundaries is maintained at acceptable levels, and to facilitate a cooperative approach for the integrated development and management of interprovincial streams and aquifers to ensure their sustainability.

Environment Canada fulfills the monitoring conditions described under the Master Agreement and provides information from 75 long-term water quantity monitoring stations, 16 meteorological stations and 12 water quality monitoring sites. Other agencies provide information from an additional 13 water quantity monitoring stations. Five of the water quantity stations are also used for international apportionment calculations. The information collected at these stations is used to calculate natural flows and the levels of water quality parameters.

- More information, visit: www.pnr-rpn.ec.gc.ca/water/fa01/index.en.html

Environment Canada, in collaboration with Health Canada, the CCME and the Committee of Environmental and Occupational Health (CEOH), has contributed to the development of a comprehensive multi-barrier approach to improving drinking water protection. The approach addresses the protection of source waters from contamination, effective water treatment, and secure distribution and storage. The 'source to tap' framework will guide the development and implementation of stronger national guidelines for water quality, improve monitoring, and guide research priorities. The "Source to Tap - Protecting Our Water Quality" section of the CCME website was launched (June 2002). It highlights how governments are working to strengthen the protection of water quality.

A Federal Water Quality Management Framework to strengthen federal water science, First Nations' water management and risk management for water quality was developed collaboratively by federal departments using a "source-to-tap" approach.

Instruments and Tools

The Department provides a wide range of instruments and tools to assist other governments and Canadian citizens in managing all aspects of water (e.g., laws, regulations, water metering and pricing guidelines, education, information and outreach activities).

In 2002, Environment Canada began consultations on a proposed Risk Management Strategy addressing ammonia dissolved in water, inorganic chloramines and chlorinated wastewater effluent to manage the release of these substances to the environment. Pollution prevention planning requirements under CEPA 1999 for owners of selected municipal wastewater systems was proposed as the first step. The Strategy also includes plans to work with provinces, territories and other stakeholders to develop a long-term strategy for managing wastewater in a more comprehensive way across Canada.

Environmental Effects Monitoring (EEM) is a science-based tool that can detect and measure changes in aquatic ecosystems (i.e., receiving environments) potentially affected by human activity (i.e., effluent discharges). Currently the Canadian pulp and paper industry is required to conduct EEM under the *Pulp and Paper Effluent Regulations* under the *Fisheries Act*. The NWRI has recently published a national assessment of pulp and paper EEM data which concludes that pulp and paper mills are not impacting the ability of Canadians to consume fish. The assessment shows that policy and regulations informed by sound science can have a direct impact on desired environmental outcomes.

In 2002, Environment Canada and its partners successfully promoted the CCME Water Quality Index as the water quality indicator chosen by the National Round Table on the Environment and the Economy (NRTEE) in its Environment and Sustainable Development Indicators (ESDI) for Canada initiative.

International

Internally, a Global Water Strategy for Environment Canada has been developed and will continue to be refined. The Strategy adheres to three guiding principles: focus on strengths (science and governance), apply principles for action (partnerships, capacity building, and good governance), and focus on priority areas (WSSD commitments on water). A Canadian delegation tested elements of this strategy at the 'Managing Shared Waters' conference (which involved over 400 participants from 35 countries) in May 2002.

A new publication, entitled, "Water and Canada: Preserving a Legacy for People and the Environment", was jointly produced in 2002-2003 with provinces, territories and other federal departments. The publication was distributed at the 3rd World Water Forum. It promotes Canada's experience in governance models, knowledge sharing and international water programs.

As part of the ongoing commitment to restoring the Great Lakes Basin Ecosystem, efforts to restore environmental quality in the Severn Sound Area of Concern (AOC) have paid

off. In June 2002, this AOC was accepted as "de-listed" by the International Joint Committee (IJC). In October 2002, Environment Canada signed an MOU with seven other federal departments to cement accountabilities for the Great Lakes Water Quality Agreement.

Internal Efforts

The Department is in the process of developing a comprehensive Water Strategy which considers the status of water-related activities across the Department and develops a departmental vision of water. The Water Strategy includes a Results-based Management Framework that will be further developed to better position water across departmental Business Lines, and to identify areas of action including science, information for decision makers, instruments and tools, and better co-ordination of strategic international activity.

What are the next steps and future challenges?

Budget 2003 earmarked $600 million over the next five years to improve the quality of water and wastewater treatment in First Nations communities. Implementation of a new First Nations Water Management Strategy will enable First Nations to address crucial elements including infrastructure upgrades, effective operations and maintenance, certification of operators and stronger inspection regimes. Environment Canada will collaborate with other federal partners, provinces, territories and First Nations to promote the highest standards of environmental protection and progress.

Environment Canada will continue to build momentum for the water agenda in all areas noted above - science, governance, instruments, international relations and mandated departmental responsibilities. This will include:

- Reinforcing good governance across all jurisdictions by advancing a "Federal Water Quality Management Framework — From Source to Tap";
- Strengthening federal leadership in water quality and quantity science through NWRI and Meteorological Service of Canada initiatives for better integration of knowledge and decision-making in Canada and internationally;
- Facilitating federal collaboration on cross-cutting issues or initiatives to ensure a horizontal, co-ordinated and effective approach (e.g. the Agricultural Policy Framework, the National Programme of Action for the Protection of the Marine Environment from Land-based Activities (NPA), Canada's Oceans Strategy, Canadian Shellfish Sanitation Program, Federal Aquaculture Strategy, the First Nations Water Management Strategy, the St. Lawrence Action Plan, and others);
- Advancing national water policy objectives through collaboration with provinces and territories on water issues of national priority, including: protecting water from source to tap; protecting drinking water through CCME, the federal-provincial-territorial Drinking Water Committee and Health Canada; the prohibiting bulk water removals; and increasing water quantity issues for domestic and agricultural needs;
- Reinforcing Canada's contribution to global water issues by promoting the implementation of WSSD outcomes, drawing on Environment Canada's strengths in science, information,

partnerships and governance; the International Year of Freshwater is a major opportunity for highlighting Canada's water initiatives;

- Developing sustainable water use strategies with key sectors beginning with municipal and agricultural sectors;
- Continuing social science work on water with the federal government; the Municipal Water Use Survey collects water use, pricing and financial data that will help decision makers become better managers and policy makers – such information is critical to activities that attempt to define indicators and calculate the value of water in natural capital balance sheets; and
- Continuing to build consensus on Canada-United States transboundary water issues and on priorities for protecting Canadian interests in water and aquatic ecosystem resources.

SHOWCASING AN ENVIRONMENT CANADA ECOSYSTEM INITIATIVE

THE GEORGIA BASIN ECOSYSTEM INITIATIVE (GBEI)

What is the issue?

Ecosystem initiatives (EIs) are co-operative efforts to address complex environmental issues affecting targeted ecosystems. EIs help Canadians achieve environmental results through partnerships, pooling resources, focusing science, co-ordinating efforts, sharing information and experiences and generating a broad basis of support. They help build the capacity of all the players involved to make better decisions and to effect change. Environment Canada has three primary objectives in supporting EIs: to provide science in support of ecosystem sustainability; to lead and act as a catalyst in mobilizing partners to address sustainable development; and to build the capacity of communities to better understand the key ecosystem stresses and make environmentally sound decisions.

As of March 31, 2003, Environment Canada had six Ecosystems Initiatives in place:

- Georgia Basin Ecosystem Initiative
- Northern Rivers Ecosystem Initiative
- Northern Ecosystem Initiative
- Great Lakes Basin Ecosystem Initiative
- St. Lawrence Vision 2000
- Atlantic Coastal Action Program

- For more information on the Environment Canada Ecosystem Initiatives, visit: www.ec.gc.ca/ecosyst/

Covering 135,000 square kilometers, the Georgia Basin ecosystem is one of the most diverse regions of North America: diverse in its ecology, in its landscape, and in its

peoples. It is part of a larger transboundary ecosystem, often referred to as the Georgia Basin–Puget Sound region. In the past 25 years, the population in the Georgia Basin ecosystem has more than doubled. By 2020, the population in the Basin is expected to reach 4 million in Canada, and in excess of 5 million in the Puget Sound region. The growing population of this region, particularly in areas outside the established urban centres, significantly contributes to the cumulative stresses on the land, air, water and other ecosystem resources.

What are we doing about it?

In 1998, within the overarching context of managing the impacts of population growth, Environment Canada together with the former B.C. Ministry of Environment, Lands and Parks launched the Georgia Basin Ecosystem Initiative as a five-year action plan to address pressures, impacts and threats to the sustainability of the Georgia Basin. Since 1998, a large number of other partners including other levels of government, U.S. agencies, community groups, First Nations groups, and industry representatives, have joined the GBEI.

The common theme "Working Together for the Georgia Basin" mobilized key government departments and other stakeholder groups to encourage innovation and partnerships and build capacity for collaborative delivery of programs in support of natural and community sustainability. Among other things, the GBEI was a catalyst for implementing pilot projects and best practices, transferring scientific knowledge, and serving as a forum for stakeholders representing a wide range of interests in sustainability in the Georgia Basin.

At the outset, the GBEI was divided into four components:

- Supporting Sustainable Communities;
- Achieving Clean Air;
- Conserving and Protecting Habitats and Species; and
- Achieving Clean Water.

For each component, a number of overarching goals and strategic priorities were established to guide the joint planning and implementation of annual action plans. Total funding for GBEI from 1998-2003 was $21.7 million. In 2002-2003, as a conservative estimate, for every dollar of Environment Canada's resources spent the Department leveraged six dollars (6:1) in financial or in-kind contributions from GBEI partners.

- For details on the GBEI refer to: www.pyr.ec.gc.ca/georgiabasin/index_e.htm

What have we achieved?

Cumulative Performance

Over the five years of this initiative significant progress has been made, including:

- Making progress toward achieving the vision set out for GBEI;
- Establishing an effective, necessarily complex governance framework that sets the stage for future work in the Georgia Basin; and
- Meeting a wide range of public commitments set at the outset of GBEI.

Creating a Vision

The vision of GBEI is to "manage growth to achieve healthy, productive and sustainable ecosystems and communities" in the Georgia Basin. In renewing partnerships under the new Georgia Basin Action Plan (the successor program to GBEI), all partners agreed to continue to work toward this same shared vision.

The report entitled the "Interim Evaluation of GBEI*"* (completed in August 2002) concluded that progress had been made towards the vision of managing the impacts of growth. Conclusions on overall progress were as follows:

- Generally the GBEI has been making a positive contribution to managing the impacts of growth, although challenges to managing the impacts of growth remain;
- It is difficult to measure the specific contribution of the GBEI to managing the impacts of growth; and
- The ecosystem-based approach is very important, but highly challenging as the concept of ecosystem-based management is unclear.

Establishing a Governance Framework

Over the five-year period a solid framework was put in place that paves the way for achieving environmental results well into the future. In fact, the GBEI evolved into an integral component of an emerging transboundary governance and institutional framework that provides a broad sustainability context to actions undertaken. In developing the vision, Environment Canada formed a strong partnership and innovative, non-traditional agency link with the BC Ministry of Municipal Affairs.

Since 1998 this partnership has broadened to include: other federal departments (Fisheries and Oceans Canada, Parks Canada); three provincial ministries; community groups; the Coast Salish First Nations; industry representatives; and U.S. agencies

(through the Environment Canada – Environmental Protection Agency Statement of Co-operation on the Georgia Basin-Puget Sound Ecosystem, and the B.C. – Washington Environmental Co-operation Council). Finally, a statement of co-operation on ecosystem-based management was signed with the Union of British Columbia Municipalities (UBCM). With all partners, the Department strives to complement work done by others where there are parallel priorities and plays the role of delivery mechanism where appropriate.

The solid governance framework for the GBEI has clearly set the stage for future success. The "Interim Evaluation of the GBEI", along with a Five Year Perspective Report to be completed in the fall of 2003, highlight the many specific examples of progress made in terms of the innovative shared governance arrangements and associated buy-in from a wide range of partners.

Meeting Public Commitments

The two above-noted evaluations of the GBEI also confirmed that there has been progress on a substantial proportion of the public commitments made at the launch of the GBEI, and that these were largely met at the completion of the five years. Further, the capacity of Environment Canada has been enhanced through leveraged resources, improved communication, and local level program delivery. Nevertheless it was noted in the "Interim Evaluation" that the evolution in practice (actual projects) has been partial and uneven, and there is scope for more integrative, issue-based, inter-disciplinary approaches in the future.

Specifically, the "Interim Evaluation" notes that at the outset a GBEI Performance Management Framework (PMF) was set up for this 5-year initiative. Four criteria, referred to as the "progress continuum", were set up in the PMF. The progress continuum is a conceptual model of progress, from ideas to action. The four stages in the continuum were:

- *Advancing scientific understanding*: Generation of new science, information and/or knowledge;
- *Awareness/capacity*: Implementation of new and innovative mechanisms to transfer information and knowledge;
- *Behaviour change*: Progress or success in influencing decision making (for behaviour change); and
- *Incremental environmental, social and/or economic improvements*: Progress or success in effecting environmental improvements or change.

The "Interim Evaluation" indicated that progress was made in all aspects of the progress continuum, more so at the first two levels: advancing scientific understanding and awareness/capacity. Further the evaluation noted that the PMF had a positive impact on the work of GBEI participants, as follows:

- The PMF led co-ordinators to change the way they do their work;
- The PMF was considered to be conceptually sound;
- The PMF helped to focus, plan and organize projects;

- Intermediate outcomes were seen as broad statements which were of some use in keeping projects headed in the intended direction; and
- Measures of performance have been developed and applied to many projects, whether or not in the context of the PMF.

In summary, new approaches to partnerships, both formal and informal, established under the GBEI allowed Environment Canada to better deliver its environmental mandate within a larger sustainability context. Specifics have been widely communicated to partners and audiences through annual public reports and milestone announcements. Public and stakeholder steering committee meetings have also been instrumental in relaying progress, as have gatherings like the Georgia Basin/Puget Sound Research Conference.

In summary, the Interim Evaluation of GBEI indicated that:

- Significant progress was made in many projects to advance scientific understanding.
- Many mechanisms have been developed and applied, with initial signs of success, to raise decision-makers' awareness and capacity.
- Assessing behaviour change is difficult, yet several indications of influence on decision-making have been identified.

There were few indications of incremental environmental, social and/or economic improvements resulting from the sample projects at this early stage.

Major, Specific Accomplishments Over the Five-year Period

In 2002-2003 the significant accomplishments with respect to four levels of "on the ground" accomplishments in communities across the Basin, combined with the progress in setting a vision, governance framework and meeting public commitments highlighted above, led to the renewal of the GBEI as the Georgia Basin Action Plan (GBAP) as the second phase of collaborative programming in the Georgia Basin. Broad accomplishments, detailed further in the "Interim Evaluation" as well as the Five Year Perspective reports, strongly indicate that partners collaboratively completed many specific accomplishments linked to four "on the ground" outcomes. Some specifics are highlighted below.

- For more information, and to refer to these source documents for details see: www.pyr.ec.gc.ca/georgiaBasin

Supporting Sustainable Communities

Efforts to improve understanding and respect the integrity of the ecosystem for the residents and decision makers included: support of over 58 projects initiated by not-for-profit organizations and local governments to help environmental decision-making in Georgia Basin communities; annual reports, workshops, and a website to enhance communication and dialogue; partnering on the development of a range of "decision support tools" for more sustainable planning, including the Smart Growth Tool Kit, Georgia Basin QUEST, and the Stewardship Centre; and developing and reporting on a variety of community-based, regional and transboundary indicators.

Achieving Clean Air

The level of understanding of the sources, impacts and management challenges and opportunities associated with improving air quality in the region have advanced significantly over the past five years. As the Georgia Basin's airshed spreads across international borders, the GBEI gathered local, provincial, state and federal governments from both Canada and the U.S. to develop common strategies to deal with air pollution. Studies on the nature and causes of air pollution were compared with specific levels across the Georgia Basin. Extensive analysis determined that while traditional pollution-causing sources like motor vehicles and power plants account for smog and high levels of PM (airborne particulate matter), emissions from marine vessels are also responsible. A Pacific 2001 Air Quality Study detailed the sources and formation of PM and ground-level ozone, establishing in the process an advanced centre for air quality study in the Fraser Valley. In addition, the GBEI examined the effects poor air quality has on human, plant and animal health and on the economy, as well as the projected impact climate change will have on our airshed.

Collaborating on Outreach Activities

In conjunction with community leaders and municipal governments, the GBEI has partnered on a number of outreach and awareness-building efforts that promote the protection and restoration of the environment. The Business Environmental Pledge Program, implemented in the City of Abbotsford, recognizes prominent groups and businesses that show concern for the ecosystem. The Rock Bay Contaminant Reduction Project in Victoria Harbour, a joint endeavour of the Burnside Gorge Community Association and the Veins of Life Watershed Society, plans to improve water quality, in conjunction with the City of Victoria's Stormwater Management Plan by reducing chemical contamination of the bay sediments. A Community Based Action Program for Shorelines aims to improve awareness and understanding of the need for healthy, natural shorelines, with workshops and presentations aimed at realtors, shoreline residents, municipal businesses and other groups. The Nature of Cities, an outreach and education campaign in Victoria and the Lower Mainland, provides a tool box of environmental policy and program suggestions and innovative protection and partnership strategies. It showcases best practices from across the country, and provides sound arguments for better green space protection and management.

Conserving and Protecting Habitats and Species

In an effort to protect and preserve the habitats and species of the Georgia Basin, the GBEI conducted studies to identify sensitive ecosystems and habitats, and the stresses that result from pollution and other human interference. Monitoring the levels of pollutants in waterbirds and the declining breeding rates among amphibians served as an indicator of the overall health of the Georgia Basin ecosystem. Tracts of land that contain especially sensitive or at-risk plants and animals, such as Garry Oak woodlands, were acquired for protection, and a new National Park Reserve for the southern Gulf Islands will be established in 2003. The recovery of wild steelhead populations began, as did less obtrusive marine mammal viewing practices. The development and promotion of conservation and stewardship partnerships, and broader landscape-based approaches to biodiversity conservation have been introduced into land-use planning processes, to better integrate the protection of ecological values into growth management strategies and private land management practices.

Working Together to Develop an Air Pollution Inventory

Pollution in the Lower Fraser Valley comes from a variety of sources. To develop an inventory of emissions throughout the Georgia Basin, a number of partners came together to create the Year 2000 Emissions Inventory. This inventory lists common air contaminants as well as ammonia, PM 10 and PM 2.5, and greenhouse gases. Local emission sources that lead to the formation of PM include industry, power plants, vehicles, agriculture and natural sources like vegetation and the ocean. The inventory also provides information on the amount and dispersal of pollutants responsible for SMOG and will be used to forecast emissions. This information is crucial for decision-makers on both sides of the border in setting future mission-control strategies to better manage air quality. One important finding that emerged from the inventory was the discovery that emissions coming from marine vessels including freighters and cruise ships are comparable to emission levels from motor vehicles**.** This has prompted Environment Canada, Water Land and Air Protection and the GVRD to begin discussions with industry representatives and other regulatory agencies in an effort to obtain international co-operation in reducing emissions from this sector.

Achieving Clean Water

In support of the Clean Water goal, the level of understanding of the sources, distribution and impacts of key toxic substances on the ecosystem has been improved through inventories and research. Best management practices to reduce impacts from agricultural and stormwater runoff have been developed and implemented, and community-based approaches for watershed management and remediation of closed shellfish harvesting areas have been advanced. Educational tools and training to improve the operation and maintenance of on-site sewage disposal systems (e.g., septic tanks), promote “Green Boating” to reduce waste discharges from vessels, and minimize risks associated with the use of agricultural chemicals have all contributed to improved stewardship of the ecosystem.

Protecting Garry Oak Ecosystems

The Garry Oak woodlands are incredibly complex, supporting over 100 species at risk. Fragments of the Garry Oak ecosystem are becoming increasingly rare, as it is among the four most endangered ecosystems in Canada. With less than 5% of British Columbia’s original Garry Oak ecosystem remaining in Canada – all within the Georgia Basin – the GBEI placed priority on acquiring remnants of these woodlands. Over the past five years several Garry Oak sites have been acquired for the purposes of conservation. Considered the best example of this ecosystem in BC, research and study at the Cowichan Garry Oak Preserve will focus on protecting existing plants and animals and controlling invasive species.

What are the next steps and future challenges?

The Georgia Basin Ecosystem Initiative set the groundwork for collaborative, ecosystem-based action in the Georgia Basin and Puget Sound transboundary region. Due to the success of this initiative Minister Anderson announced its renewal on April 2, 2003 as the Georgia Basin Action Plan (GBAP). The GBAP is built upon a vision of "healthy,

productive and sustainable ecosystems and communities in the Georgia Basin" that is shared by Environment Canada, Fisheries and Oceans Canada, Parks Canada, BC Ministry of Water, Land and Air Protection, and BC Ministry of Sustainable Resource Management. In support of this vision, these partners are collectively applying their mandates, values and resources to address the challenges confronting the Georgia Basin ecosystem and are providing an opportunity and invitation to others to join in the Action Plan.

Recovery of Shellfish Harvesting Areas

Over the past five years, the GBEI has worked in partnership with several coastal First Nations to raise public awareness of shellfish harvesting concerns. In the Nanaimo River Estuary Project the Snuneymuxw First Nation worked with government agencies and various non-government partners to develop an estuary management plan. Under this plan water samples were analyzed for chemical and bacteriological contaminants, and sources of pollution were identified. The result of this work has been the development of an opportunity for a seasonally controlled depuration fishery along the eastern shore of Nanaimo. Other projects throughout the Georgia Basin have emphasized the importance of partnerships between the GBEI and local communities.

Partners have agreed to a "Framework for Collaboration" under which new goals and priorities will guide the delivery of shared, co-operative actions to achieve specific results. These goals are strongly linked with Environment Canada’s mandate, and provides the Department with the opportunity to demonstrate leadership and effectively partner in a more integrated, ecosystem-based context. The Department will provide funding through targeted resources for this initiative, while other partners fund from their A-base budgets. At times, the Department provides financial support; at other times, it leads projects, supports others and/or reports results.

The process of identifying specific performance targets for GBAP is well under way and represents a significant opportunity for the Department to work within a complex governance structure where the needs and goals of a diverse set of partners must be considered. Measuring societal behaviour is extremely difficult to do, as was recognized during the five years of the GBEI. Nevertheless, developing indicators to measure take-up rates for specific projects (and associated behaviour change) is a critical component to measuring the effectiveness and success of GBAP.

4.3 Weather and Environmental Predictions

Strategic Outcome: Help Canadians adapt to their environment in ways that safeguard their health and safety, optimize economic activity and enhance environmental quality

As Canadians, we are affected by weather and environmental conditions such as tornadoes, winter storms, floods, droughts, smog, variable lake levels, extremes in temperature and precipitation, aircraft turbulence, sea ice conditions, and road icing. These conditions can affect our health and safety, businesses, the economy, and the environment. The Meteorological Service of Canada (MSC), the core service supporting the Weather and Environmental Predictions (WEP) Business Line, operates 24 hours per day, 365 days per year, to forecast weather and environmental conditions from coast to coast to coast.

Environment Canada works to reduce risks to Canadians from weather-related and environmental hazards by providing warnings of hazardous and severe weather and by supporting other government departments and agencies in their decision-making. The Department's work also helps weather-sensitive industries, such as transportation, energy, fisheries, forestry and tourism, to improve productivity and competitiveness, as well as rendering their operations environmentally sustainable. The Department also provides the federal government with essential scientific information to support the development of effective policies on key issues such as clean air, clean water and water management, and climate change.

Within Environment Canada's Management Framework, the WEP strategic outcome is supported by two key results. Consistent with the structure provided in the departmental Report on Plans and Priorities (RPP), priority concerns have been grouped under the key results to which they relate. This logic structure is shown in the Table and the narrative performance comments that follow.

<table>
<tr><th colspan="4">STRATEGIC OUTCOME AREA:
WEATHER AND ENVIRONMENTAL PREDICTIONS</th></tr>
<tr><th colspan="4">Key Results:</th></tr>
<tr><th colspan="2">Reduced Impact of Weather and Hazards</th><th colspan="2">Adaptation to Changes</th></tr>
<tr><th colspan="4">Priority Areas Reported On :</th></tr>
<tr><th>Service Improvement</th><th>High Impact Weather and Related Hazards</th><th>Science Capacity</th><th>Modernization</th></tr>
</table>

Weather and Environmental Predictions Business Line

Help Canadians adapt to their environment in ways that safeguard their health and safety, optimize economic activity and enhance environmental quality

Environment Canada, through the Weather and Environmental Predictions Business Line, aims to achieve two key results:

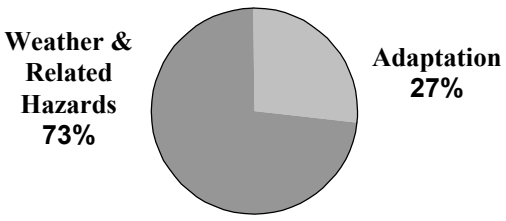
- reduced impact of weather and related hazards on health, safety and the economy; and,
- adaptation to day-to-day and longer-term changes in atmospheric, hydrological and ice conditions.

Spending by Key Result ($millions)

(including respendable revenue)

Reduced impact of weather and related hazards on health, safety and the economy.	$ 192.5 *$ 187.0* **$ 188.3**
Adaptation to day-to-day and longer-term changes in atmospheric, hydrological and ice conditions.	$ 67.7 *$ 82.8* **$ 71.0**
Total for the Business Line Planned Spending *Total Authorities* **Actual Spending**	$ 260.2 *$ 269.8* **$ 259.3**

Actual Spending



Key Partners

An extensive list of partners from all sectors of society by program area can be found in EC's Report on Plans and Priorities 2003-2004 (http://www.ec.gc.ca/rpp/2003/en/a7a.htm#anchor71). Partners relevant to the initiatives reported on in this period have been included in the narrative of this report.

Key Targets and Overall Results

Overall key indicator (as per Section 3 of this report) – weather-related disasters in Canada (estimated losses); for detailed targets under consideration see EC's Report on Plans and Priorities 2003-2004 (see http://www.ec.gc.ca/rpp/2003/en/a3a.htm#anchor33).

Overall results sought as stated above.

Program, Resources and Results Linkages

Monitoring program (atmospheric, air quality, water quality) - expenditures 2002-2003- $91.2M

Forecast Production program (supercomputer, weather centres) - expenditures 2002-2003-$90.2M

Service Delivery systems (phone, web, radio dissemination with partners) - expenditures 2002-2003-$10.3M

Science (climate, meteorology research, UV program) - expenditures 2002-2003-$46.1M

National Support Systems (operational training, telecommunications, policy) expenditures 2002-2003-$21.5M

Management Practices

MSC Operational Review and ongoing contributions to the horizontal management initiatives of the Department (reported in the Management, Administration and Policy Business Line template).

A CASE FOR CHANGE…SHAPING A VISION FOR THE FUTURE

The MSC is one of the most sophisticated weather and hydrometric services in the world, with a $375 million technological infrastructure that operates 24 hours a day, 365 days a year. It is recognized internationally for world-class weather prediction services and excellence in atmospheric science research. This precedence sets high expectations for continued exemplary service as well as improvements in the future. To assess the existing state of the organization in light of future expectations, the leadership of the MSC undertook an in-depth review of its program and services. In taking stock of the strengths and weaknesses several factors, both internal and external, emerged.

Internally, challenges identified included an overextended, aging workforce, an infrastructure becoming rapidly obsolete and a lack of visibility with potential client groups. Strengths included continued recognition of the MSC as a leader in communications and a long history of dedication to service supported by science. Externally, the changing environmental context provided additional drivers for change, including the increased frequency and severity of extreme weather and environmental hazards, and the need to adapt to a changing climate.

Advances in science and technology as well as the different ways in which governments are organized to deliver service – via increased collaboration multi-laterally and bi-laterally with the U.S., public/private partnerships, with academe, and with citizens and other stakeholders directly – presented other challenges to the MSC. Management concluded that, while individually these were manageable challenges, cumulatively this was not the case. Push factors (identified internally within the MSC) created a sense of urgency for change, and pull factors (external to the MSC) reflected changes taking place in domestic and global environments. Together these factors created the articulation of a new or desired state — An MSC Vision for the Future.

While the Vision is still under development, the core theme is service improvement. Specific areas of service improvement include:

- Placing a priority on high-impact weather, precipitation forecast, improving lead times, and providing new products and services;
- Developing of new services such as road weather information systems;
- Ensuring quality of service through verification systems and surveys;
- Strengthening partnerships with media, private sector, emergency organizations;
- Optimizing distribution channels such as radio, telephone and Internet; and
- Ensuring sustainability of the organization through modernization of infrastructure, technology and expertise.

4.3.1 Key Result: Reduced Impact of Weather and Hazards

Reduced impact of weather and related hazards on health, safety and the economy

SERVICE IMPROVEMENT

What is the issue?

The long-term goal of the MSC is to improve Canadians capacity to adapt, anticipate, mitigate, withstand, and recover from high-impact events and related hazards to ensure that Canadians live in healthy communities, where threats from environmental hazards are minimized.

What are we doing about it?

To achieve this goal, the broad strategies in addressing service improvement are to:

- Improve the quality of products and services;
- Find innovative ways to deliver these products and services to the public, private and academic sectors; and
- Strengthen partnerships and develop stronger capacity with the private meteorological sector.

What have we achieved?

Cumulative performance

In 2001, the MSC began an extensive effort to articulate a comprehensive service strategy. Internal initiatives such as the active dissemination of warnings, needed to be reflected together with external initiatives, such as the federal government Service Improvement Initiative. This Initiative committed the Government of Canada to a 10% increase in citizen satisfaction with services within the next four years, and an emerging focus on increasing public access to data and information. Current service delivery mechanisms are tailored across the MSC to reflect individual regional needs and capacities. Regional differences are being given careful consideration in the development of future plans. Individual business cases are being developed for each priority service activity, in order to assess how these activities are currently undertaken; how they should, ideally be conducted; how success would be measured; what recommendations might be made for focusing future efforts; and what impacts might result from implementation of the recommendations.

While the development of a comprehensive service strategy has been a recent achievement, service is fundamental to daily activities in the MSC, and continued service improvement has been a consistent priority for the MSC. Annually, the MSC issues approximately 14,000 severe

weather warnings and 3,500 ice hazard warnings, and provides about 500,000 public weather forecasts, 200,000 marine weather forecasts and 400,000 aviation forecasts.

The mass media are the primary means by which the MSC reaches Canadians, and are vital to ensuring that Canadians receive weather information, particularly warnings, in a timely manner. Weather information can also be accessed via the following Environment Canada dissemination systems:

- *Internet:* Weather web pages at http:\\weatheroffice.ec.gc.ca. "Weatheroffice" is one of the federal government's most heavily used Internet sites, with over 3 billion hits per year.
- *Telephone:* Free recorded messages provide basic public forecasts and a 1-900 user-pay phone service enables callers to speak directly to a meteorologist 24 hours a day.
- *Weatheradio:* Bilingual weather information is continually broadcast over Weatheradio VHF frequencies.

Weather services are among the most frequently used federal government services. Polls indicate that 92 per cent of Canadians consult at least one weather forecast each day.

Noted below are specific service improvement initiatives with respect to quality of services, innovation in service delivery and continued strengthening of partnerships.

$150 billion of our nation's economy is weather-sensitive.

Major performance accomplishments in 2002-2003

Improve the Quality of Products and Services

National Survey on Meteorological Products and Services: A telephone survey of Canadians was undertaken in 2002, to assess their needs, usage, satisfaction and expectations concerning weather products and services provided by the MSC. It was found that weather information clearly matters to Canadians, with 92 percent noting that such information is at least of some importance in their daily lives. The public is largely satisfied with the ability to get weather information needs on a consistent basis. Canadians are also largely satisfied with the accuracy of various specific aspects of weather forecasts, including precipitation and temperature. Winter forecasts are of greatest priority and are most likely to be meeting Canadians' expectations in terms of accuracy. Nearly all Canadians are satisfied, overall, with weather warnings received in their area; variations across regions are modest. Satisfaction has less to do with accuracy than with receiving sufficient notice in advance of approaching weather. Across general types of weather information, the public places greatest importance on weather warnings followed by precipitation and temperature forecasts. The survey revealed that accurate precipitation forecasting represents the largest "service gap" between the public expectations and satisfaction levels with the services received.

Post-Event Surveys on Weather Warnings: The MSC commissioned two surveys following severe weather events (e.g. thunderstorms and winter storms) to determine whether Canadians see or hear weather warnings, as well as to determine actions taken upon hearing warnings, and the impacts, if any, of events. These surveys help the MSC to understand public perceptions and behaviour with respect to severe weather and warning messages and measure the effectiveness of

such warnings in reducing negative impacts. Post-event surveys were conducted in Saskatoon, Saskatchewan (thunderstorm warning), and the Fraser Valley, British Columbia (snowfall and freezing rain warning). In each survey, a majority of respondents recall the weather warning. The most commonly mentioned source for warnings is television. The most common weather warning information recalled by respondents was the type of severe weather to expect. The majority of respondents who saw or heard warnings believe they provided enough information. A vast majority of respondents believed it was important to hear about weather warnings when they are issued. Survey results are being used to improve the MSC's public outreach and education programs.

Continued Support for Department of National Defence: The MSC continued to provide extensive meteorological support to Operation APOLLO, Canada's military contribution to the ongoing counter-terrorist operations in the Middle East. Weather Services Centres (WSCs) in Halifax and Comox supplied forecasts to navy ships enroute to the Arabian Sea. The WSC in Greenwood prepared daily depictions of significant weather over the area for military commanders and planners across Canada and in the Middle East. The MSC uses a weather prediction model to provide detailed forecast guidance in support of these efforts. Weather information provided in support of ship transits is important to making decisions on ship routing and operation. It is also critical for flight operations of the ship-borne Sea King helicopters. In both cases information aids in safe, efficient operations in a difficult environment.

New Services — Sea State Forecasting: Since June 2002, the MSC Quebec region has disseminated sea state forecasts for the St. Lawrence River, and will extend this service to Hudson Bay and James Bay in 2003. The MSC will work to install the same architecture for delivery of marine services in the other regions. This new service was made possible with funding from the National Search and Rescue Secretariat and through a partnership with Fisheries and Oceans Canada. This partnership led to the creation of a wave model that incorporates MSC wind forecasts with Fisheries and Oceans bathymetry and marine currents. The MSC incorporated user comments on model output, resulting in a state-of-the-art model of wave-ice interactions. This model is being used in real time by operational meteorologists in the Quebec region. In the future, sea state bulletins and products will be derived from the model and graphic products with forecasts of waves and other weather parameters will be delivered via the Internet. As a result, users and those responsible for safety will be able to make better decisions in hazardous situations and to plan for safer sea-related activities.

Innovation in Service Delivery

Media Weather Portal: Environment Canada is now offering a dedicated, free weather service for Canadian news media. Implemented in October 2002, the new media web portal provides media contacts (TV, radio, cable networks, newspapers) with improved access to weather information. Canadian media organizations now have access to a customized service, in a timely manner that consists of high quality up-to-date weather information. With information automatically refreshed every five minutes, this new service enables media outlets to receive data tailored to their needs, directly from the MSC. It offers independent media-only access ensuring media continuous, uninterrupted access. The Media Weather Portal's features include: weather

alerts, including high impact weather warnings; current conditions; public forecasts; satellite, radar and lightning imagery; and marine forecasts and ice information.

Improved Weather Warning Identification for Media: In conjunction with the Canadian Association of Broadcasters, new protocols to assist media personnel in identifying priority weather warning messages were implemented. These protocols will help ensure the timely distribution of weather warnings to their audiences.

Wind Energy Simulation Toolkit: The Wind Energy Simulation Toolkit (WEST) is a high resolution Canadian wind mapping system developed using the MSC's computer weather prediction infrastructure. Using this tool MSC entered into a partnership with a utility company, Manitoba Hydro, and two industrial partners in order to generate a modernized wind atlas for the portion of Manitoba south of 54 north latitude. Deliverables include a geographical information system (GIS) interfaced high resolution wind grid, representative of the past 50 years, as well as winds at very fine scales.

Strengthening Partnerships and Building Capacity

Building Awareness Through Education —"The Sun Savvy Challenge": The Terry Fox Public School in Brampton, Ontario registered for the "Children's UV Index Sun Awareness Program", thereby accepting the challenge to become a "Sun Savvy School". The school received a UV Index poster and brochure from the MSC and registered for the "Sun Savvy School Club". There are 1500 schools in Canada registered in the "Children's UV Index Sun Awareness Program". Participating schools measure the UV Index in their school environment and enter data into the MSC UV Index Web site. Terry Fox Public School organized sun savvy assemblies with the MSC and the Regional Health Unit for Peel Region. MSC staff gave a presentation on the UV Index, sun safety and the relationship between UV radiation, weather, ozone depletion, climate change and air quality. Over the next year, the program will be expanded with new activities and information guides for high school students. Through this program, jointly funded by the MSC and Health Canada, young Canadians are better able to protect themselves from harmful effects of UV radiation.

Strengthening Capacity in Private Meteorological Sector: The private meteorological sector in Canada is small, but diverse. Environment Canada is building stronger relationships with this sector by encouraging the development and use of value-added meteorological services. The Department is working to improve data access and identify new and emerging business opportunities for this sector.

What are the next steps and future challenges?

In the future the MSC will focus more effort on outreach activities to ensure Canadians are aware of, and are deriving maximum value from the wide range of services offered to them. As well, MSC will seek to ensure there is a greater understanding of user needs so that MSC services can be aligned with these needs. Other service improvements to be implemented in the future include:

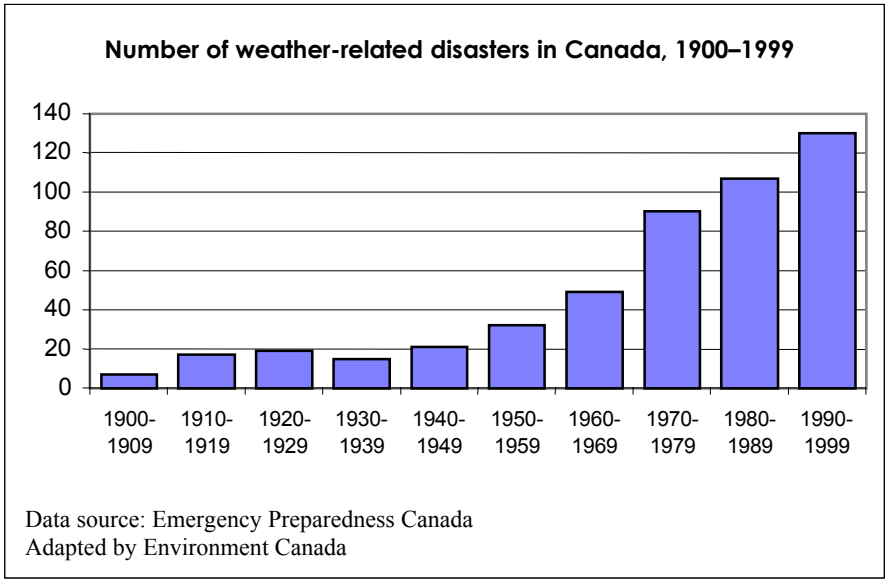
- Looking at other possibilities for the "weatheroffice" Web site in order to provide access to information for all Canadians;

- Finalizing and implementing a new weather services charter;
- Preparing to support new initiatives such as road weather services in partnership with Transport Canada and the provinces; and
- Improving water quantity monitoring services through the new hydrometeorology laboratory being created in Edmonton (management of floods and droughts will be strengthened as the MSC provides improved baseline information to those who manage such events).

HIGH IMPACT WEATHER AND RELATED HAZARDS

What is the issue?

The risks to health, safety, property and the economy from naturally occurring environmental hazards, such as ice storms, floods, drought, and wind, are increasing. Other environmental hazards, such as poor air quality, may be produced or intensified by human activity. As well, property and economic losses due to environmental hazards have increased dramatically in recent years. Canadians are becoming more vulnerable to high-impact weather and related hazards because of growing urban density, ageing infrastructure and the creation of complex but vulnerable production and delivery systems.



Data source: Emergency Preparedness Canada
Adapted by Environment Canada

In 1998, Canada spent $3 billion to repair damage from high impact weather and related hazards. According to the Insurance Bureau of Canada, disaster recovery payments (from insurance companies and taxpayers) doubled every five years throughout the 1980s and 1990s.

What are we doing about it?

In partnership with others, Environment Canada wants to improve the capacity to adapt, anticipate, mitigate, withstand, and recover from high-impact events and related hazards by improving lead time, accuracy, utility and satisfaction with warnings. To achieve this goal, the broad strategies include:

- Science strategies that improve prediction capability and monitoring technology that increases lead times;
- Outreach strategies for public alerts and targeted communications to communities most at risk; and
- Service strategies to partner with first responders to provide them with critical weather warning information.

What have we achieved?

Cumulative Performance

The MSC has clearly identified high impact weather and related hazards as a priority area within prediction services. The scope for this area, in terms of scientific and technological needs, management, and communication strategies, is constantly under review. Air quality has also emerged as a specific area of concern. As a result, there has been considerable progress in new predictive capacities and strategies for communicating with Canadians. Research and development within the MSC has recently been focused on supporting high impact weather and related hazards as a priority. This effort is starting to yield results with new innovative projects with partners. In addition, there have been continual improvements in other areas as noted in several examples provided below.

Major performance accomplishments for 2002-2003

Science Strategies

Severe weather research conducted by the MSC is primarily carried out in Montreal through the Laboratoire universitaire sur le temps extreme (LUTE). The LUTE is a collaboration between the MSC and the Network for Computing and Mathematical Modeling. A network of eight Montreal-based research centres and their industrial partners, focus on co-ordinating and promoting research in extreme weather such as storms, tornadoes and droughts. The MSC Hurricane Centre in Halifax supports severe weather science and prediction, with a specific focus on hurricanes and storms.

Monitoring Systems for Emergency Response: Since the Chernobyl nuclear disaster 15 years ago, the MSC has been making investments in order to understand and predict the movement of radioactive material in the atmosphere. By 1993, specialized numerical modelling tools were implemented operationally at the Canadian Meteorological Centre (CMC), to assess and forecast the dispersion of hazardous materials, with global coverage. Following terrorist attacks in the United States on September 11, 2001, highly specialized numerical simulation tools were used when the MSC was called upon to provide technical, scientific and operational support to Canada's emergency response programs. During the morning of the attacks, the CMC rapidly provided specialized guidance regarding long-range atmospheric transport and dispersion of plumes from the locations attacked. Simulations were quickly completed and used by Health Canada to help in their assessment of potential risks due to the plumes.

In July 2002, the MSC collaborated with federal and provincial partners to numerically model smoke plumes associated with forest fires that began in Northern Quebec using the Canadian Environmental Emergency Response Model (CANERM) dispersion model. Numerical guidance

and short-term weather forecasting techniques were used to predict the passage of the smoke plume over eastern Quebec and the Atlantic provinces. The CANERM model, designed and implemented operationally to support nuclear emergency response and to track airborne volcanic ash for aircraft operations, is a specialized application model integrated within the global and regional data assimilation and numerical weather prediction systems at the CMC.

Today, these highly specialized numerical simulation tools, coupled with the operational global numerical weather prediction system at the CMC, are ready at all times to ensure a responsive reaction when required. Most recently, the MSC was able to expand its monitoring capacity, as a result of receiving $1 million from the Department of National Defence's Chemical Biological Radiological and Nuclear Research Technical Initiatives Fund. Funds were used to purchase six new generation portable upper air radiosonde monitoring systems for emergency response to potential terrorist incidents and other environmental incidents involving the release of hazardous substances into the atmosphere. The MSC has used similar equipment in the past, to track such events as the Hagersville, Ontario tire fire, the fallout from the Chernobyl nuclear accident and major volcanic eruptions.

The Canadian Hurricane Centre: Three systems of tropical origin, (Arthur, Gustav and Isidore) affected Canada and its territorial waters in 2002-2003. The Canadian Hurricane Centre issued 65 Hurricane Information Statements regarding eight tropical cyclones in 2002.

Outreach Strategies

Specific outreach strategies for the past year were focused on supporting severe weather awareness activities and emergency preparedness exercises in regions of Canada often subject to extreme weather. In October 2002, the MSC implemented "Weather Warning Battleboard" software on its Weatheroffice Web site, providing a simple and effective graphical public weather warning display. The software allows users to determine, from one Web site, official MSC weather warning status throughout Canada, in both official languages.

- For more information, visit: www.weatheroffice.ec.gc.ca

The Prairie and Northern Region has been conducting severe winter and summer weather warning weeks since 1998. The Warning Preparedness Meteorologists (WPM) work in partnership with local media to heighten awareness of severe weather among emergency managers, schools, and the public. In 2002-2003, the WPMs generated over 2800 contacts with these players.

Targeted efforts: MSC Atlantic region held its second annual Summer and Winter Severe Weather Awareness Campaigns, to help raise awareness of the risks associated with severe weather in the region, and to help Canadians learn how to prepare for these events. Awareness and preparedness messages were delivered through media interviews; public service announcements; and, through presentations by MSC staff, and via the regional Severe Summer and Winter Weather Awareness Web sites. These messages were presented to schools, the insurance industry and provincial and municipal departments. The official opening of the Holyrood Doppler Radar Installation was held during the winter campaign to highlight technology used in today's modern weather service.

- For more information, visit: www.atl.ec.gc.ca/weather/severe/summer_e.html

Survey on High Impact Weather Events: As mentioned previously, the MSC commissioned two surveys following severe weather events (a thunderstorm in Saskatoon in the summer of 2002 and a combination of a freezing rain and snowstorm in the Fraser Valley in the winter of 2002-2003) to determine whether Canadians see or hear weather warnings, to determine the actions they took upon hearing the warnings, and the impacts, if any, of the events. These surveys help the MSC to understand public perceptions and behaviour with respect to severe weather and warning messages and measure the effectiveness of such warnings in reducing negative impacts.

Project Anti-Freeze

In April 2002, in the Prairie and Northern region, the MSC participated in an emergency preparedness exercise called Project Antifreeze. The objective was to evaluate responses of various organizations to a simulated severe ice storm and blizzard affecting southern Manitoba over a three-day period. Municipal and federal governments and private and volunteer organizations were represented. An MSC forecaster provided weather briefings as the simulated storm evolved. The forecaster also acted as the spokesperson on weather conditions during simulated media scrums. This exercise promoted the need for cooperative emergency preparedness and management, assisted participants in identifying deficiencies in current emergency plans and enhanced their understanding of the interdependencies among organizations in dealing effectively with emergencies.

Service Strategies

One of the key areas of effort over the past year was on building relationships with first responders, such as Emergency Preparedness, National Defence, provincial and municipal emergency measures and response agencies, to increase efficiencies in information management and response times. Efforts in 2002-2003 were directed to Prairie and Northern Region's Warning Preparedness Meteorologists Program and on-the-ground emergency teams in Nova Scotia and Quebec.

Warning Preparedness Meteorologists Program: The Warning Preparedness Meteorologists (WPM) Program was developed to strengthen relationships with media, emergency management officials (EMO) and the education sector. WPMs work with these groups to ensure Canadians are aware of and are prepared for severe weather. Since 1998, WPMs have been providing severe weather preparedness training to various EMOs and have been actively recruiting volunteer weather watchers. The WPM Program is used throughout the MSC as a template to establish similar programs. WPMs had a very busy year, with over 2,800 contacts with businesses, media, government agencies and the public. They conducted severe weather awareness training for more than 3 000 people, assisted in developing brochures for two severe weather campaigns, and provided promotional material to television and radio media.

Building Relationships with Emergency Managers – Nova Scotia: The MSC participated in the design of an exercise of the Emergency Measures Organization in Nova Scotia for Emergency Preparedness Week in May 2002. The event was used to test the emergency communications capability within Nova Scotia. The CENTWARN (Central Warning) system was practised with provincial agencies, power and communication industries, radio stations and amateur radio operators. The intent of the exercise was to establish an emergency communications system in the event of an incident causing power outages and communications failure. MSC devised a realistic weather event that could be used to produce such a scenario.

The MSC was also involved with Search and Rescue SARScene 2002, an annual conference attended by search and rescue volunteers from all around the world. The conference, held in Halifax, featured a presentation by the Program Manager of the Canadian Hurricane Centre on

forecasting hurricanes “Canadian Style”. The presentation included the frequency, types and impacts of tropical systems and forecasting challenges of transitioning storms in northern latitudes. The Emergency Weather Station was set up to demonstrate the capabilities in remote sensing for Environmental Emergency Response needs.

Building Relationships with Emergency Managers — Quebec: After flooding in the Saguenay Valley in July 1996, and an ice storm in southwestern Quebec in January 1998, the Quebec Government’s Department of Public Security recognized the importance of weather services for crisis management. As a result, a special relationship was created between the government’s emergency preparedness function and the Quebec Region of MSC. In 2002, the province established the Centre de veille de la sécurité civile (emergency monitoring centre) in Quebec City. Over and above the personalized services that are provided to emergency organizations, severe weather experts from the MSC can be quickly deployed to the Centre. There they continue to have access to most of their work tools (products, technology, services, communication links) so they can advise emergency authorities and provincial and municipal agencies. This enables these experts to make informed decisions that will minimize the impact of severe weather events.

What are the next steps and future challenges?

The importance of weather and environmental services is increasing as Canadians become more vulnerable to changing weather and environmental conditions. The challenge to Environment Canada is to improve the timeframes within which environmental hazards and issues such as climate change and environmental health are addressed to allow Canadians and governments time to anticipate, prevent, withstand or adapt to such conditions more effectively. Along with the responsibility of more advanced notice, the Department must continue to work with media and other partners to inform and educate Canadians about how best to react in order to reduce the number of injuries, casualties and damage from natural disasters. This will be accomplished by taking the following actions:

- Focusing more attention on high-impact events through automating routine forecasts as much as possible;
- Applying the advances that science and technology offer for the future;
- Transferring scientific knowledge from research to production more quickly;
- Helping Canadians understand and reduce their vulnerability through outreach, education and services;
- Improving access to and dissemination of weather and environmental information and warnings; and,
- Improving support to first responders and emergency organizations (e.g., Health Canada, Emergency Preparedness, National Defence, provincial and municipal emergency measures and response agencies, etc.); and
- Increasing modeling capacity through an upgrade of the supercomputer facility.

4.3.2 Key Result: Adaptation to Changes

Adaptation to day-to-day and longer-term changes in atmospheric, hydrological and ice conditions

BUILDING SCIENCE CAPACITY

What is the issue?

Climate variability, air quality and high-profile weather events are of considerable importance to Canadians and have raised interest in several sectors, including agriculture, shipping, construction, media, health, environmental conservation, forestry and recreation, and the public. These sectors seek longer lead times, increased accuracy for warnings, increased predictive capacities for long term climate and environmental conditions, and improved ability to predict presence and levels of threats in air and water. As a result, the research and development activities of the MSC continue to be vital for the health and safety of the public and for informed policy formulation by the Canadian federal, provincial and local governments.

What are we doing about it?

The MSC conducts research to ensure that Environment Canada has a solid scientific foundation on which to build policies and strategies that safeguard our environment and protect human health. It conducts research in a wide variety of areas related to priority issues of the Department including:

- Meteorology;
- Air quality; and
- Climate change.

What have we achieved?

Cumulative Performance

Following a MSC in-depth review of its program and services, it was timely to complement internal efforts with an external peer review of research and development activities to evaluate performance and improve decision-making on departmental resources and planning. A panel of atmospheric and climate scientists and managers from the United Kingdom, the United States, Australia and France completed a review including an assessment of the productivity, quality and relevance of the science conducted by the MSC, the impact of results on services and policy development, and future directions. The panel concluded that the MSC is a world leader in many

areas of atmospheric and climate science, and that its research and development program is fundamentally sound and responsive to the needs of Environment Canada and the Canadian citizens. Some overarching areas recommended for action were: personnel succession planning; an ongoing peer review process; increased university collaboration; better client interactions; and a strategic science plan.

Specifically, in the panel's report, **Climate Research** was found to be appropriately goal-oriented and properly aligned with Canada's specific climate-interests and policy-guidance needs, however, it was noted that climate change research efforts would benefit from increased international modeling research collaboration. Recommendations on **Air Quality Research** included: adoption of a planning process involving both scientists and management to strengthen strategic need to anticipate emerging issues; continued support for high arctic research and expertise; and a focusing on modeling efforts in ozone and fine particulates down to local levels, greenhouse gases, acid deposition, heavy metals and persistent organic pollutants. Within **Meteorological Research,** recommendations included increased collaboration with similar institutions internationally, and increased attention to nowcasting (current warnings information) techniques using a mix of radar satellite and short period numerical weather prediction data.

- The Panel's complete observations and recommendations provided to senior management are available at: www.msc-smc.ec.gc.ca/acsd/publications

Plans are being developed to address recommendations made by this panel. Some actions are already underway, including the development of a Strategic Plan for MSC Research and Development (to be completed in the fall of 2003), and the extension of the Canadian Foundation for Climate and Atmospheric Science (CFCAS) through 2010, which will promote funding opportunities through partnerships with universities. Several million dollars of funding has been granted in areas related to heavy precipitation analysis and prediction, behaviour of tropical cyclones in the middle latitudes, and severe summer and winter storms in the Great Lakes.

Major performance accomplishments for 2002-2003

Weather

The MSC conducts Research and Development (R&D) on severe weather, numerical weather and environmental prediction, data assimilation, satellite meteorology, radar meteorology and cloud physics – with the goal of improving weather and environmental predictions and warnings in Canada.

Mesonet

Two groups of university-based scientists in Quebec obtained grants from the Canada Foundation for Innovation to establish infrastructure for research in meteorology and agricultural geomatics. Under the project, entitled Mesonet, approximately $1.1 million will be used to establish some 40 automated weather stations within a 100 km radius of Montreal. These stations will be in addition to existing ones belonging to the MSC and its partners. They are needed to increase the density of measuring stations in support of meteorology and research objectives. The scientists have asked for assistance and expertise from the MSC in planning the network and in installing and

operating the stations, including data communication. Several parts of the project are already complete. Locations for the stations have been identified and approximately 15 stations were installed in 2002-2003. Mesonet is an opportunity for the MSC to capitalize on two major investments in meteorology to create a very dense weather network in the Montreal area in support of Canadian atmospheric research and work related to severe weather.

Air Quality

National Air Quality Prediction Program: The National Air Quality Prediction Program in Canada provides numerical and chemical model guidance to provincial agencies and Environment Canada regions that produce daily air quality forecasts for the public. Three regional highlights from 2002-2003 are noted below:

Pacific and Yukon — In the summer of 2002 the Pacific and Yukon Region issued daily air quality forecasts based on ground level ozone in three regions (Vancouver and the Fraser Valley, Kelowna and Kamloops). In addition, a pilot project was conducted in which forecasts that included airborne particles (PM) were prepared and shared with provincial and municipal partners. The inclusion of PM in forecasts is an important step in making air quality forecasts more accurate and more relevant to health. The pilot was successful leading to forecasts based on both pollutants in 2003.

Newfoundland — In June 2002, Environment Canada's Minister, the Honourable David Anderson, and the Newfoundland and Labrador Minister of Environment, the Honourable Kevin Aylward, announced a new daily smog forecast program that informs Newfoundland residents about the predicted levels of smog in their area. The launch of the *Newfoundland Smog Forecast* was another step in the development of the air quality prediction program in Atlantic Region. The Smog Forecast was issued twice daily from June until the end of October as part of Environment Canada's daily weather forecast for the province. It enabled individuals, especially those living with asthma and other respiratory conditions, to take steps to protect their health.

> *"Clean Air for Canadians is a high priority for the Government of Canada. The Smog Forecast Program will ensure that Newfoundland residents are aware of the quality of the outdoor air that they breathe during the smog season and will give them the necessary tools to make informed choices in planning their day-to-day activities."*
>
> David Anderson, P.C., M.P.
> Minister of the Environment

Nova Scotia — The *Halifax Experimental Pollen and Spore Forecast Program* completed its third successful season by providing daily pollen and spore forecasts for the Halifax area from May 1st to September 14th, 2002. The program enables citizens to take action to avoid the health impacts of particulate matter of which pollen is a sub-class. The MSC is one partner in the project, believed to be the only one of its kind in Canada. It provided funding for an assistant researcher and supplied two pollen traps in an effort to determine the proficiency and applicability of the pollen forecasts to a suburban and rural area. Tailored weather forecasts were supplied and made available on Environment Canada's Web site and via the automatic telephone answering system. The MSC developed statistical databases on pollen and pollutant data, which are being used by the Respirology Department in the Queen Elizabeth (QEII) Health Sciences in an effort to define health impact thresholds and to quantify allergy-sufferer response.

Enhancements in Air Quality Modeling Technology and Partnerships: In recent years, the MSC has taken significant steps in using numerically-based chemical transport models for providing assistance and advice to Canadian policy-makers in reducing air pollution and for forecasting air quality.

The Canadian Hemispheric and Regional Ozone NOx System (CHRONOS) and A Unified Regional Air-quality Modeling System (AURAMS) are two of a limited number of state-of-the-art air quality modeling systems in the world. Initially a research platform, the MSC has transferred the technology to an operational environment, enabling the use of CHRONOS to forecast air quality across all of Canada and across a major portion of North America on a daily basis. Forecast products in the form of digital output and ground-level ozone maps are being viewed and used by a number of agencies in North America. AURAMS is being run on a daily basis in an experimental mode to produce improved air quality forecasts (ozone and Particulate Matter) over eastern North America. AURAMS is also being used to study emissions reductions scenarios in preparation for discussions with the U.S. towards a Particulate Matter (PM) annex to the Canada/U.S. Air Quality Accord. A unique feature of AURAMS is its ability to assess the collateral impacts of reducing emissions of pollutants such as smog (ozone and PM) and acid rain, thus minimizing the cost of such reduction efforts.

Rural-Urban Plume Evolution Experiment (RUPEE)

In August 2002, the MSC conducted a two-day study of the evolution of the urban plume downwind of Edmonton, Alberta. The city, with a regional population of nearly one million, is approximately 65 km east of several coal-fired power plants. Large petrochemical refineries and a variety of medium industry are also located in the vicinity. Atmospheric chemistry sampling was done. On the first day of sampling, a well-developed ozone plume was followed to 100 km east of the city. Emissions from Edmonton contributed to an increase in ozone of 30 ppb above natural levels. An Edmonton airshed zone is now being contemplated to assist in emissions management.

Strategic alliance between CMC and the National Research Council of Canada — The Air Quality Models Applications Group (AQMAG) of the MSC and the Institute for Chemical Process and Environmental Technology (ICPET) of the National Research Council of Canada have signed a two year co-operation agreement. Under the agreement, numerical tools will be developed to enhance, integrate, compare and assess Canadian and U.S. air quality modelling systems. It is envisaged that in two years the Canadian air quality modelling system will be able to use processed emissions inventories generated by a U.S. system, and that the U.S. air quality modeling system will be able to use meteorological fields generated by the Canadian Global Environmental Modelling System (GEM). Signed in September 2002, this co-operative agreement builds on an exchange of letters stating an intent for formal collaboration between the MSC and the National Research Council of Canada.

Completion of "Particulate Matter Science for Policy-Makers — A NARSTO Assessment" — Forty-two air quality scientists from Canada, the U.S. and Mexico have completed a three-year review of the current state of knowledge of airborne particles, a major component of smog in North America. The resulting report provides an overview of the situation across the continent, identifies problem areas and provides guidance for effective action to reduce this health concern. The assessment was co-chaired by the MSC, the U.S. Environmental Protection Agency (EPA) and the University of Minnesota. The report entitled, "Particulate Matter Science for Policy-Makers*,"* was produced to provide science-based guidance for governments and other agencies

working to reduce air pollution in North America. It summarizes current knowledge for nine key regions in North America, including smog-prone areas such as the lower Fraser Valley of southern BC and the Windsor-to-Quebec City corridor. The production of the report was co-ordinated by the North American Research Strategy for Tropospheric Ozone (NARSTO), a three-country agency of government, university and industry representatives. NARSTO's mission is to provide scientific advice to guide action to reduce smog, including ground-level ozone and airborne particles.

Climate Change

Climate research within the MSC consists of process research, field programs, data analysis, and numerical modeling. A major success has been the strong and productive research collaboration that has developed between MSC and the Canadian academic community. This interaction takes the form of direct scientist-to-scientist collaboration, as well as more formal program arrangements such as the Climate Research Network (CRN) and Canadian Cryosphere Program. These partnerships have allowed scientists to provide leadership and to be effective participants in the national climate research agenda. This has helped to build a strong climate science capacity in Canada – resulting in Canada's effective international participation in programs like the World Climate Research Program and the Inter-governmental Panel on Climate Change.

New "Green" Roof Field Site for Toronto

The MSC's new green roof field site was launched recently along with the MSC's research findings on plant-covered roofs and the urban heat island. The primary goal of the research is to assess the degree to which green roof coverage will help in meeting Canada's Kyoto targets. It was noted that green roofs could reduce summer temperatures in Toronto and could reduce Toronto's greenhouse gas emissions by over 2 megatonnes.

Most recently, the OURANOS Program was established, in May 2002. OURANOS is an international multi-disciplinary group of over 150 scientists at universities and other institutions, including the MSC, working to advance knowledge concerning adaptation to climate change in North America. The human, financial, technical and computer resources being made available to the consortium are estimated to be worth over $10 million per year.

Hydrology

Western Wetlands: For the past five years, the MSC has collaborated with the National Water Research Institute and the universities of Saskatchewan and Calgary to improve the understanding of Prairie wetlands hydrology and the influence of waterfowl populations. MSC staff use the Palmer Drought Index (PDI) to track departures of modeled soil moisture from climatologically expected conditions. It has been observed that duck populations in southern Saskatchewan correlate fairly well with the PDI; as a result, the Index is used to provide an indicator of waterfowl abundance on the Canadian Prairies. MSC staff demonstrated a strong correlation between the PDI and both the number of waterfowl and the number of wetlands across the Prairie ecozone. Climate change scenarios were tested using this strong relationship. Results suggest a range of possible futures with most scenarios indicating a significant decrease in the number of wetlands and waterfowl populations. One scenario showed a slight increase in wetlands and waterfowl populations.

Lunenburg Bay Marine Environmental Prediction System: Dalhousie University, together with the MSC and other partners, is developing a Marine Environmental Prediction System (MEPS) that will improve the ability to forecast physical, chemical, and biological changes in the marine environment and assess the impacts of climate change and coastal development. This research project is a major development in technologies for observing and forecasting changes in coastal waters. Construction and installation of MEPS atmosphere-ocean instrumentation was near completion in 2002. A multi-disciplinary team will develop a real-time prediction capability for the coastal regions of Atlantic Canada. The MEPS atmosphere-ocean observing system in Lunenburg Bay will be used to guide and test the marine coastal prediction system in an examination of marine environmental phenomena that are important on daily to weekly time scales. The outcomes will be particularly relevant for the problem of coastal pollution and the resulting technology will be transferable to other similar coastal areas.

What are the next steps and future challenges?

The ultimate key to success of Environment Canada's research and development lies in securing a long-term funding base for research efforts where results are observed only in the longer term. The implementation of a strategic plan for the MSC's Research and Development activities is an important step in achieving this objective.

In addition, attracting, developing and retaining talented scientists is a critical challenge faced by the Department, given competitors who can often offer attractive positions more rapidly to candidates. This is particularly important given the large numbers of retirements expected over the next five years. Additional challenges face the MSC as it develops plans to address recommendations made by the external peer review and financial resources are allocated to these priorities.

MODERNIZATION

What is the issue?

A cornerstone of government is to reduce social and economic vulnerability by providing federal services for the safety and security of Canadians. Moreover, Canadians want those services kept modern and adaptive to changing economic and social need. In the 130 years since the Meteorological Service of Canada was created, the ravages of time coupled with rapid advances in science and technology have caused parts of the MSC's monitoring infrastructure to rust out or become obsolete. In addition, the Service is faced with the reality of an ageing scientific workforce. The MSC needs a broad-based solution to manage the threat posed by infrastructure and human-resource challenges, and to maintain the integrity of Canada's weather and water service.

What are we doing about it?

Environment Canada's broad policy and program strategies in addressing the transition of the MSC focus on:

- Maintaining expertise through recruiting and training new technicians, meteorologists and scientists;
- Increasing employees access to training and professional development opportunities;
- Removing and replacing obsolete infrastructure; and
- Integrating new and more innovative technologies into the monitoring networks to enhance capacity for observation.

What have we achieved?

Cumulative Performance

With the resources available, the MSC focused its modernization efforts in priority areas, including recruitment and training of meteorologists and hydrologists, and the WEP Business Line's capital investment priority, the National Radar Project. Following extensive efforts to identify the needs for transition to a more sustainable service, in March 2003, the Environment Minister announced an investment in the MSC of an additional $75 million over the next five years. With some of these new resources being directed to MSC modernization, the organization is well positioned to make greater advances in recruitment, training and infrastructure replacement.

Major performance accomplishments for 2002-2003

Maintaining Expertise

Meteorologist Recruitment and Training: In September 2000, the Meteorologist Operational Training Program for new meteorologists began to fill a gap in expertise by recruiting and training meteorologists. Selected candidates from across Canada traveled to one of the MSC training centres (Dartmouth, Montreal or Edmonton) to begin the intensive hands-on program, which provides participants the practical skills needed to work in an operational environment. Since March 2001, 57 candidates have graduated and joined the Department's regional weather-centre offices. Instructors in the three centres received a Citation of Excellence for their work and the recruiting team received the Diversity Leadership Award for building a more diverse workforce.

Project Phoenix

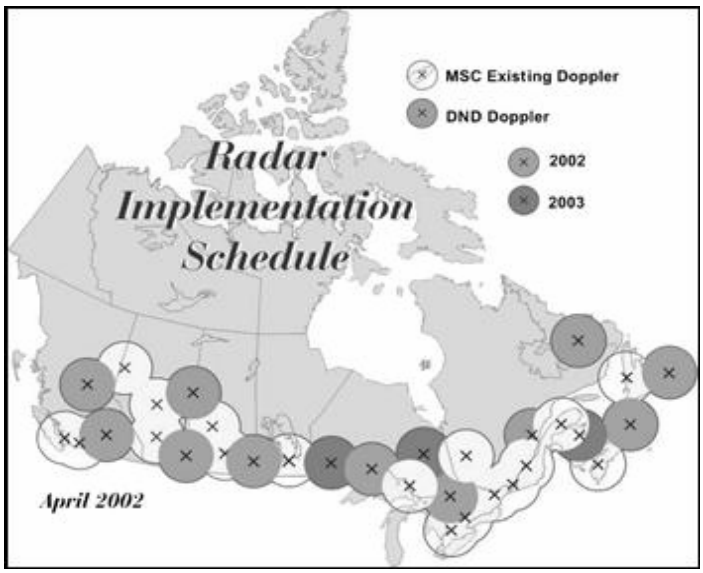
The Prairie Storm Prediction Centre in Winnipeg, Manitoba, developed and implemented Project Phoenix - a training system that simulates a weather centre in order to help prepare forecasters for the future. The three-person simulator allows forecasters to fine tune their skills in critical time-frames (such as the first 24 hours). "Nowcasting", as this type of forecasting is known, puts more emphasis on the analysis and diagnosis of weather observations, the forecasting of significant weather, and the utility of the forecast. The system is expected to become an ongoing training mechanism for forecasters.

Sharing Knowledge – MSC holds Forecasters Forum: Over 150 individuals attended the inaugural MSC Forecasters Forum, held in Victoria in February 2003. Of these, over 100 were operational meteorologists. The forum provided excellent opportunities to share information, to allow staff to have input into the development of the program as well as their own careers and to help develop a community vision of the future role of the MSC.

Hydrometric Recruitment and Training Project: In 2001, the Water Survey Program took a significant step in addressing its ageing technical workforce by developing an accelerated recruitment and training program for hydrometric technicians. Led by the Prairie and Northern Region, the two-year project was developed to fill current and impending vacancies in the hydrometric program and to train new employees in all Occupational Safety and Health requirements, as well as in measurement equipment, techniques, and standards. By the end of 2002-2003, 40 new recruits were trained as "field ready" employees for the Water Survey program by the Saskatchewan Institute of Applied Science and Technology in Moose Jaw — an educational facility that has provided water-resources engineering technology training for over 30 years. All new recruits are now working in MSC regional offices.

Infrastructure Changes —Modernizing Networks

National Radar Project: Under the MSC's seven-year, $34.9 million National Radar Project, all weather radars will be converted to Doppler by 2003-2004 to improve the detection and prediction of environmental hazards, such as severe weather and floods. As part of the ongoing upgrades to the National Radar Network, in 2002-2003, seven new Doppler radars were installed:



- Doppler Radar for Northwest Ontario — May
- Doppler Radar for Alberta at Schuler —August
- Doppler Radar for Western Manitoba near Foxwarren and eastern Saskatchewan — September
- Doppler Weather Radar officially inaugurated in Cape Breton — October
- Holyrood, Newfoundland — October
- Mount Silver Star, British Columbia — October
- Thunder Bay, Ontario - December

When completed, the network will extend from St. John's, Newfoundland to Victoria, British Columbia and provide coverage for 95 % of the country's population.

- Imagery produced by this technology is available to the public on Environment Canada's "weatheroffice" Web site at http://weatheroffice.ec.gc.ca/radar/index_e.html.

Canada's Global Climate Observing System Surface Network in the North: The Action Plan 2000 on Climate Change financed the upgrade of eight GCOS Surface Network (GSN) sites and the installation of seven new sites north of 60°. To have adequate global coverage, the GCOS goal is to have a monitoring station in each 5x5 degree grid for the world. Canada's regional coverage does not meet this standard. There are large geographical gaps in the north that hamper the MSC's ability to understand environmental change and its implications. Existing GSN stations, which primarily provide temperature and total precipitation data sets, are being upgraded to include measurement of wind speed and direction, humidity, rate-of-rainfall, snow cover and radiation. These enhanced data sets are needed to effectively document and understand climatic processes. The 2002-2003 installations are the first in a three-year project that will add 22 new GSN sites to Canada's high latitudes and upgrade 23 others. These stations will become part of Canada's commitment to the Global Climate Observing System Surface Network that includes 54 stations located south of 60°. The first year installations were completed on schedule and under budget despite the challenges associated with work in Canada's north. Co-location of GSN installations with other MSC or NAV CANADA sites was the primary reason for savings of approximately $150,000.

Innovation Through Technology

In August 2002, Minister Anderson and Captain Grant Warner, Vice-President Flight Operations for Air Canada Jazz, announced the launch of a new program to obtain and transmit weather data from aircraft. Canada's Aircraft Meteorological Data Relay Program, or AMDAR, will improve the accuracy of Environment Canada's weather forecasts and will provide better information to the aviation industry for use in their operations.

"We are very pleased to be a part of this innovative program which will assist in the provision of improved weather information, and will provide assistance to the Canadian Government, the aviation industry and the Canadian population in general. This partnership makes Air Canada Jazz the first airline in Canada to provide this new source of essential data."

Captain Grant Warner
Vice-President, Flight Operations
Air Canada Jazz

The AMDAR Program reports weather data, collected from meteorological sensors and the navigational, processing and communications systems found on board 21 Air Canada Jazz Dash-8 aircraft, in near real-time to the MSC, which integrates it into its numerical weather prediction models. This new cost-effective use of technology will complement the MSC's network of 31 upper air stations which currently collect weather information on the upper atmosphere using ground based instruments and weather balloons.

These data, now available from more locations and on a more frequent basis, will improve the accuracy of weather forecasts. These forecast improvements will contribute to reducing costs to the airline by avoiding diversions to other airports, unscheduled fuel stops and by avoiding fuel consumption. AMDAR data from Canada will be distributed around the world to other meteorological services via the Global Telecommunication System. The MSC received accolades from the World

Construction of a new secure room for the MSC supercomputer at the Canadian Meteorological Center (CMC) in Montreal was completed in 2002-03. In November 2002, the MSC signed a contract with IBM to replace its existing supercomputer, scheduled for the fall of 2003.

Meteorological Organization AMDAR Panel, for its work with regional airlines, an area that holds the greatest potential for expanding the AMDAR program in many parts of the world.

- For more information on AMDAR, visit: www.ec.gc.ca/press/2002/020806_b_e.htm

What are the next steps and future challenges?

The short-term focus for the MSC will be the re-positioning of the organization as per the Minister's announcement on March 13, 2003. The MSC transition will involve five main components:

- Consolidation and modernization of the MSC's forecast operations;
- Creation of new National Service Offices and outreach capacity;
- Restoring and developing key skill sets;
- Introducing product and service enhancements and innovation; and
- Invigorating the MSC's monitoring capacity.

Modernization and renewal is fundamental to most of these initiatives, whether it be renewal of the MSC's human resource capital or the modernization of hardware and software infrastructure. With respect to the latter, this includes the remediation of older monitoring sites to meet present environmental standards.

This transition is a major undertaking for the MSC. It will proceed in concert with on-going operational and research and development activities at the MSC.

4.4 Management, Administration and Policy

Strategic Outcome: Provide strategic and effective departmental management to achieve environmental results

The context in which Environment Canada operates is one where environmental issues are global in nature, jurisdictions are shared and the challenges of integrating environmental, economic and social factors must be addressed. As such, it is important to ensure strong linkages across the Department in the development of strategic directions related to both horizontal management and policy issues.

Through the Management, Administration and Policy (MAP) Business Line, Environment Canada develops an integrated management and policy agenda. This is the Department's strategic medium- and long-term agenda focusing on leadership, knowledge management and partnerships to inform and engage citizens, and developing ways to provide efficient, innovative internal and external services.

Within Environment Canada's Management Framework, the MAP strategic outcome is supported by two key results. Consistent with the structure provided in the departmental Report on Plans and Priorities, priority concerns are grouped under the key results to which they relate. This logic structure is shown in the table and the narrative performance comments that follow.

STRATEGIC OUTCOME AREA: **MANAGEMENT, ADMINISTRATION AND POLICY**	
Key Results:	
Policy Priorities and Plans	**Well Performing Organization**
Priority Areas Reported On :	
Environmental and Sustainable Development Agenda	**Transforming the Way We Do Business**

Management, Administration and Policy Business Line

Provide strategic and effective departmental management to achieve environmental results

Environment Canada, through the Management, Administration and Policy Business Line, aims to achieve two key results:

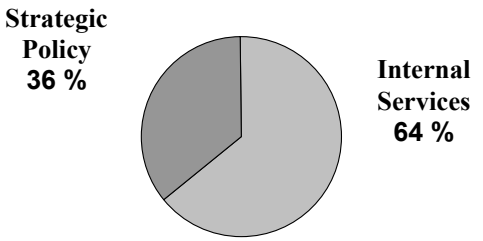
- strategic and integrated policy priorities and plans; and
- a well-performing organization supported by efficient and innovative services.

Spending by Key Result ($millions)

(including respendable revenue)

Strategic and integrated policy priorities and plans.	$ 49.3 *$ 49.4* **$ 55.0**
A well-performing organization supported by efficient and innovative services.	$ 72.1 *$ 90.8* **$ 95.8**
Total for the Business Line	
Planned Spending *Total Authorities* **Actual Spending**	$ 121.4 *$ 140.2* **$ 150.8**

Actual Spending



Key Partners

An extensive list of partners from all sectors of society by program area can be found in Environment Canada's Report on Plans and Priorities 2003-2004 (http://www.ec.gc.ca/rpp/2003/en/a7a.htm#anchor71). Partners relevant to the initiatives reported on in this period have been included in the narrative of this report.

Key Targets and Overall Results

Overall key indicators are under development; for detailed targets under consideration see Environment Canada's Report on Plans and Priorities 2003-2004 (see http://www.ec.gc.ca/rpp/2003/en/a3a.htm#anchor34).

Overall results sought as stated above.

Management Practices

Horizontal management initiatives include: Modern Management Action Plan; Management Services Review; and Government On-Line and Service Improvement.

4.4.1 Key Result: Policy Priorities and Plans

Strategic and integrated policy priorities and plans

ENVIRONMENT AND SUSTAINABLE DEVELOPMENT AGENDA

What is the issue?

An understanding of the complexity of environmental issues and the links between different environmental and economic and social factors that affect our well-being, is critical to setting a successful environment and sustainable development agenda. Environment Canada recognizes that achievements over the longer-term depend on an ability to find creative solutions that contribute not only to a healthy environment, but also to a prosperous economy and a vibrant and just society.

A key ingredient for integrated decision-making towards sustainable development is having the right information, at the right place, at the right time. Improvements to our current information and knowledge base would enable us to provide a more solid foundation for informed public debate, as well as policy and program development and evaluation that fully integrates environmental, social and economic variables.

Critical to advancing the environment and sustainable development agenda are market signals and incentives that account for environmental costs (externalities) and encourage activity that ensures that our environment is conserved and protected. Traditionally, this has been done through a command-and-control approach, i.e. regulations to address specific environmental problems. Internationally and domestically, there is a growing recognition of the need to broaden the mix of policy tools and to shift the balance towards more innovative, market-based instruments that reflect environmental costs in the price of goods and services.

Achieving results through effective partnership arrangements is both a requirement and a critical opportunity in the transition to sustainable development**.** A number of emerging trends and pressures point to the need for a more strategic federal role on the environment and sustainable development, for example:

- The federal government has greatly enhanced its legislative tools and obligations (e.g. *Canadian Environmental Protection Act* (CEPA), *Species at Risk Act* (SARA));
- There is growing industry and public pressure to harmonize and streamline environmental processes and make greater use of market-incentives to influence behaviour change; and
- Progress on emerging environmental and sustainable development issues is increasingly dependent upon coordinated North American and/or international efforts.

What are we doing about it?

Environment Canada is working to ensure that sustainable development principles are integrated in a meaningful way within its own policy, programs and operations and by building capacity and commitment with partners in the public and private sectors and with Canadians. Environment Canada plays a leadership role in mobilizing the delivery of the federal government's environment and sustainable development agenda and works in collaboration with other countries and with international organizations to support sustainable development globally.

Critical to Environment Canada's policy agenda are the following:

- *Knowledge* (science, information and indicators) — to drive sound decision-making and management;
- *Incentives, innovative tools and instruments* — to promote changes in attitudes and behaviours, shift the focus to prevention, more fully value natural capital; and
- *Partnerships and strategic alliances* — to achieve efficiencies, ensure effectiveness and attain concrete results.

All of these areas are represented in Environment Canada's Sustainable Development Strategy. Please see Appendix A (A1) for more detail.

What have we achieved?

Cumulative performance

Since 1997, the federal government has made $5.3 billion in direct investments in the environment. The 2002 Speech from the Throne and Budget 2003 represent the culmination of a period of major progress on key environment and sustainable development issues. The Budget took ambitious steps towards implementing sustainable development as a government-wide priority. The Budget also invested significantly in the Department's priority environmental issues, including $2 billion for climate change actions, $800 million for environment and health issues (including *Canadian Environmental Protection Act*, air, water and contaminated sites) and $200 million for nature (including species at risk, and National Parks and Marine Conservation Areas).

Knowledge

Across Canada, the information base related to environment and sustainable development is in need of improvement both to facilitate decision-making and to inform the public. In an effort to further contribute to building this information base in Canada, the Department has committed to working with partners to develop the Canadian Information System for the Environment (CISE) and advance work on indicators and market signals.

The Department and its partners now have a vision for a national information system. In October 2001, the CISE Task Force presented its final report, outlining a vision for the System based on providing timely access to, and effective application of credible environmental information. CISE will enable governments and stakeholders to share and integrate relevant on-line information from numerous sources to enhance their ability to evaluate options and make well-informed

decisions. Environment Canada leads this initiative and is working with partners inside and outside of government to: bring together available environmental data; identify and address gaps; encourage the use of this information by decision-makers; gather information in the area of governance; and, launch demonstration projects. Environment Canada collects and provides a significant amount of environmental data, through on-going environmental monitoring programs (e.g. National Pollutant Release Inventory) and State of the Environment Reporting. Development of Canada-wide indicators, (e.g. the Environment and Sustainable Development Indicators Initiative of the National Round Table on the Environment and Economy (NRTEE), or those described in Environment Canada's Environmental Signals Report) will support a more comprehensive, national assessment of the condition of the environment, and will help us to better measure our progress.

Incentives

Significant opportunities exist to build understanding and support for market-based instruments and other non-regulatory mechanisms to effect environmental behaviour change. While environmental regulation will continue to play an important role in ensuring the health and safety of Canadians and our natural environment, Environment Canada has been developing new policies and approaches that focus less on command and control or end-of-pipe solutions. These include voluntary programs and incentives such as Environmental Performance Agreements (EPAs) and Pollution Prevention (P2) Plans. Both of these tools were made possible by the Canadian Environmental Protection Act (CEPA) 1999, which gives the Department more flexibility in terms of its approach to managing environmental issues including market incentives for pollution prevention, environmental emergencies, and enforcement. (See Clean Environment, Air Quality and Toxics sections for more detail.)

Environment Canada's response to climate change has provided an opportunity to implement a number of innovative economic instruments, such as a domestic emissions trading system. This system will mark the first significant use of economic instruments to control air emissions in Canada. This recognition of the important role of market-based instruments in a high-profile policy area reflects work undertaken over a number of years by Environment Canada. Further work will focus on the details of the trading system, including institutional arrangements, links to international trading, and development of an offset credit system. Similarly, the Clean Air Accord provides another opportunity for the Department to move forward with transboundary emissions trading. Environment Canada also continues to research policy options to expand the suite of market-based instruments and tools available to respond to emerging issues.

Partnerships

Environment Canada believes that partnerships are the best way to manage a shared responsibility for environment and sustainable development work across jurisdictions (national, international) and various government portfolios and with First Nations. The development and implementation of Canada-wide Standards (CWS) for Particulate Matter (PM) and Ozone provide good examples of how effective federal/provincial/territorial partnerships help ensure that our international and national commitments are met.

To mobilize the federal government to take action on environmental issues, the Department has been working with other government departments to implement mechanisms to facilitate inter-

departmental co-operation and to give environmental initiatives more impetus. Recently, an Environmental Framework (see below) was developed to help to co-ordinate environmental objectives across government. Highlighting the importance of the environment and sustainable development for the federal government, a Deputy Minister-level committee, co-chaired by Environment Canada and Natural Resources Canada, has been mandated by the Clerk of the Privy Council Office to address environmental and sustainable development issues in a collaborative and coherent manner. These relationships have helped to co-ordinate a consistent, government-wide approach on issues such as clean air and climate change. In addition, bi-lateral relationships, such as collaboration with Health Canada, help to ensure an integrated approach to policy development on priority issues, such as environment and human health and the effects of environmental hazards on children.

The development of networks and partnerships to enhance the effectiveness and efficiency of Canadian environmental research activities is a priority for Environment Canada. The Department continues to work towards better integration of science and technology across science-based departments, and is implementing the Canadian Environmental Sciences Network (CESN). One regional network, the Atlantic Environmental Sciences Network (AESN) is well underway.

The Department continues to work internationally with other countries to advance its environment and sustainable development agenda. The recent World Summit on Sustainable Development (WSSD) in Johannesburg in August/September 2002 was the focus of considerable departmental effort in preparing for the event and ensuring meaningful outcomes. Other international fora through which the Department continues to advance its priorities include, for example, the Health and Environment Ministers of the Americas (HEMA) and the Commission on Environmental Co-operation (CEC).

We continue to work with non-government organizations (NGOs) in a variety of ways (e.g., from core support for the Canadian Environmental Network (CEN) to ad hoc consultations and partnership arrangements), and that we also work with private sector at different levels (e.g., through major industry associations through voluntary initiatives, or with small enterprises through programs such as EnviroClub in Quebec).

Major performance accomplishments for 2002-2003

Advancing the Environment and Sustainable Development Agenda in Canada

In summary, the following accomplishments were noteworthy in 2002-2003:

- Endorsed by the federal government in May 2002, the Framework for Moving Forward on the Environment Agenda is a practical tool designed to help departments set priorities within the government's environmental agenda. The Framework applies to all environment-related policies, programs and projects and is based upon our knowledge, incentives and partnerships approach to environmental policy-making. The Framework clearly lays out a series of guiding principles and identifies when, where and how the federal government should take action on an environmental issue. The Framework is designed to be flexible in viewing this wide range of issues, while at the same time providing clarity around the federal role and principles that guide our decision-making in these areas.

- Environment Canada continues to work with other departments to ensure that the environment and sustainable development agenda is a major portion of the government-wide agenda. These efforts have been increasingly recognized in the Speech from the Throne 2002 and the Budget 2003 which have sustainability as a key theme. As well, important departmental programs such as the Agriculture Policy Framework and the new infrastructure investments meet important environment and sustainable development objectives.
- Environment Canada worked with other departments (including Natural Resources Canada, Parks Canada, Indian and Northern Affairs Canada, Health Canada, Department of Fisheries and Oceans, Agriculture and Agri-Food Canada) to promote a more horizontal approach for managing upcoming federal government announcements that concern horizontal files (e.g. climate change water, natural legacy, protected areas, etc.). This new horizontal approach helps to ensure a consistent message and common look-and-feel.

Advancing the Environmental Agenda Internationally

In summary, the following accomplishments were noteworthy in 2002-2003:

- As host of the G-8 in 2002, Canada was able to influence a variety of international agendas and to ensure that our environmental priorities (health and environment, water, international governance and partnerships) were at the forefront of discussions.
- In 2002, Canada's Environment Minister held the position of President of the Governing Council of the United Nations Environmental Programme (UNEP), offering another opportunity for the Department to influence the international agenda.
- It was a dynamic year for Environment Canada as, in addition to our substantive participation in the WSSD, Canada hosted three key international meetings: the HEMA (Health and Environment Ministers of the Americas) Meeting, G-8 Environment Ministers Meeting, and the Commission of Environmental Cooperation (CEC) Ministerial Meeting.

Knowledge: Improving the Environmental Information Base

Following the recommendations of the CISE Task Force, the initial development phase of CISE was designed to test the role and function of the System and build partnerships. At this time, priority was given to supporting the Environment and Sustainable Development Indicators Initiative (ESDI) of the National Round Table on the Environment and the Economy (NRTEE). The NRTEE indicator priorities are clean air, clean water, biodiversity and climate change. To help provide the necessary national data sets to support this Indicators Initiative, four demonstration projects were launched in 2002. In addition to these four, CISE also implemented projects that linked distributed information from federal and provincial sources in the areas of water quality, air quality and biodiversity. Work is ongoing to ensure that CISE projects are proceeding with a degree of consistency, and are addressing standards, policies, and system interoperability from the outset. Two key areas of focus have been metadata and online mapping.

Further to our work on CISE, Environment Canada is working with other national information systems, to ensure minimal duplication of effort, share expertise and lessons learned, and ensure interoperability. These systems include:

- The GeoConnections program of Natural Resources Canada, a national initiative to provide Canadians with geospatial information over the Internet;
- The National Forest Information System (NFIS), a nationally distributed system on forest information currently under development; and

- The National Land and Water Information System, a recent initiative to provide decision-support tools at the farm level.

In addition to co-ordinating with other national information systems, Environment Canada is also working with provinces and territories to develop a smog index and a Canadian biodiversity index. Over the past year, Environment Canada has published Environmental Signals: Canada's National Indicator Series 2003 and Environmental Signals: Headline Indicators 2003 to provide credible information on the state of Canada's environment to Canadians.

Environment Canada is supporting Statistics Canada's project to expand Canada's System of National Accounts (SNA) to include environmental accounts. These environmental accounts will enable the development of a more detailed and rigorous understanding of the relationship between the environment and the Canadian economy. This year, Environment Canada's support has focussed on water. In particular, this refers to reviewing the content and methodology of the Municipal Water Use Survey and the Industrial Water Use Survey (survey last conducted in the mid-1990s) to guide future surveys, and to explore other potential surveys of sectors for which limited water use data are available (e.g. agriculture, commercial). Environment Canada is also working with Statistics Canada on a project to value water resources as one component of Canada's natural capital.

At the 2002 World Summit on Sustainable Development (WSSD), Canada announced that it would invest $3 million towards the initiative Strengthening Health and Environment Linkages: From Knowledge to Action. The purpose of this initiative is to strengthen the knowledge base on the linkages between environment and human health and to increase capacity to effectively address environmental threats to human health. The initiative hopes to accomplish this by assembling scientific, technical and socio-economic information on environment and health linkages, and transferring that knowledge to inform decision-making and enhance capacity at the local, regional and national levels. In practical terms, this would be accomplished through the promotion and use of assessment methodologies; the sharing of experiences on policy interventions; and the strengthening of capacity to consider environment and health in decision-making.

The Ecological Monitoring and Assessment Network (EMAN) Coordinating Office

The Ecological Monitoring and Assessment Network (EMAN) Coordinating Office delivered on the Canadian Community Monitoring Network pilot project, the most comprehensive and inclusive research into effective approaches to community-based monitoring in Canada to date. The pilot, conducted in 31 communities resulted in a standardized approach and tools for engaging citizens and community decision-makers in generating and using environmental information to improve local decisions related to conservation and sustainability. Based on first characterizing the nature of the information needed by relevant decision-makers, suitable indicators and monitoring mechanisms are then designed to inform local choices, deliver effective input to adaptive management, and link to 'professional' science as an adaptive response to indicated changes.

◗ For more information see: www.ccmn.ca

The Department's science and research activity is the underpinning for our program and policy work. Key accomplishments include:

- A draft federal strategy to address knowledge gaps in understanding the ecosystem effects of genetically modified organisms (EEGMOs) was completed in December 2002. The research strategy was developed in consultation with the Fisheries and Oceans Canada, Agriculture and Agri-food Canada, the Canadian

Food Inspection Agency, Health Canada, NRCan, the Canadian Biotechnology Strategy Secretariat and the National Research Council.

- Steps were taken to develop environmental research agendas with a number of research councils, including the Social Sciences and Humanities Research Council (SSHRC), Natural Sciences and Engineering Research Council (NSERC) and the Canadian Institutes for Health Research (CIHR). The Department worked with CIHR to develop a research agenda related to environmental influences on human health.

Incentives: Developing and Implementing Innovative Instruments

Environment Canada continued to build broad support for market-based incentives and economic instruments with other government departments, provincial, territorial and municipal governments, and key Canadian and international stakeholders.

As mentioned earlier in this section, a significant accomplishment was the inclusion of emissions trading for greenhouse gases (GHGs) (specifically with respect to large industrial emitters) as a key element of Canada's Climate Change Plan.

Efforts for advancing innovative policy instruments focused on developing economic tools that bridge the environmental and economic agendas. Highlights include the following:

- Under the NRTEE Ecological Fiscal Reform (EFR) project, the Department completed case studies on the potential use of economic instruments in the areas of agricultural landscapes and cleaner transportation. Project findings were as follows:
    - Agricultural landscapes — continued exploration of EFR focused on the agricultural sector is recommended. Specifically, a June 2001 ministerial commitment to accelerate the pace of improving environmental practices on-farm should be met by expanding programs based on three EFR tools; namely incentives for the development of Environmental Farm Plans, municipal property tax credits for on-farm conservation areas, and incentives for landowners to remove land from agricultural use.
    - Cleaner transportation — It was agreed that the following EFR instruments should undergo further analysis: either a tax credit or a fee/rebate instrument, to encourage sales of the full Phase II engines above mandated thresholds in the period prior to 2009. For fiscal and policy reasons, the instrument would need to be designed to avoid a "windfall" for the Phase II engines required by law in the 2007-2009 period; a subsidy program for vehicle retrofits; and a buy-back program to accelerate the scrappage of more polluting HDD trucks and buses.

Building on case study findings, the Department examined the feasibility of using economic instruments (taxes and emissions trading) to reduce sulphur emissions from light and heavy fuel oil.

- The opportunity to develop a differential toxics charge, to reduce the risk from substances declared toxic under CEPA was explored. Analysis of the potential efficiency and effectiveness of this measure, as applied to a number of pilot substances, was promising.
- Under the Clean Air Accord, Environment Canada has explored NOx emissions trading with the US. Joint modeling of cross-border NOx and SO_2 trading is underway.
- Working with Statistics Canada, the Department developed a methodological framework for valuing Canada's water resources with the goal of providing values suitable for the system of national accounts.

In terms of the application of innovative tools and economic instruments, the climate change, clean air and toxics agendas in particular presented significant opportunities for implementing innovative tax and emissions trading initiatives.

Partnerships

In 2002-2003 partnerships played a significant role in advancing the Department's environmental agenda at home and internationally, as discussed above. Partnerships with other government departments in particular, advanced the Department's SD agenda:

- Under Environment Canada's leadership, 28 departments together through an inter-departmental network to share learning, and co-ordinate their planning and action on SD. The network began a process to prepare a federal Sustainable Development Strategy (SDS)—an overarching, longer term policy framework for taking co-ordinated action on SD across the federal government.
- Environment Canada also co-chairs committees at the Assistant Deputy Minister and Deputy Minister level where work is underway to develop a more coherent longer term vision and set of priorities for the Government on sustainable development.
- The Department co-ordinated the writing of the discussion paper on sustainable communities (Sustainable Communities for a Sustainable Planet: Progress, Challenge and Opportunity for Canada) as part of Canada's preparation for the World Summit on Sustainable Development, and launched six regional urban communities pilot projects.
- In partnership with the Canadian Environmental Network (CEN), Environment Canada organized the Enhancing Working Relationships Between Environment Canada and Environmental Non-Government Organizations workshop held on March 21 2003. This informal one-day workshop, funded through Environment Canada's Learning Fund was the first of its kind among federal government departments. There were approximately 60 participants from the non-government organization (NGO) community and Environment Canada's Services and Regions. The workshop focused on how Environment Canada and NGOs work together successfully, how the relationship could be improved, and establishing a path forward with special emphasis on sustainable development strategies and WSSD implementation.

Sustainable Communities Initiative

The Sustainable Communities Initiative (SCI) is a collaborative initiative of the Nova Scotia Federal Council. It involves all levels of government (federal, provincial, municipal and First Nations Band Councils) working in two pilot partner areas (Bras d'Or Lakes and Annapolis/Fundy region) to respond to community sustainability issues and priorities. The multi-jurisdictional field team for each area is responding to the needs of, and working directly with, the local communities. In the Bras d'Or area, key community and government commitments have been identified for resolution of on-site sewage issues. In the Annapolis/Fundy area, a report has been completed on the socio-economic and environmental impacts of wharves in the community.

What are the next steps and future challenges?

Advancing the Environment and Sustainable Development Agenda

The continuing challenge is to increase awareness of how environmental quality and sustainable development contribute to an improved quality of life and present opportunities for innovation, healthier Canadians, and more livable communities. Environment Canada will continue to work with other government departments to develop a federal strategy to help make this vision a reality. Environment Canada's own Sustainable Development Strategy will be renewed for the period of 2004-2006.

Internationally, our next steps will focus on implementing the strategies and plans developed in 2002- 2003. Environment Canada will work with other G8 countries to advance implementation of WSSD commitments with a focus on the water and renewable energy aspects of WSSD commitments. The Department will also champion full implementation of the recommendations agreed to by the Inter-governmental Group of Ministers on International Environmental Governance (IEG) to strengthen the framework for co-operative environmental action. Environment Canada, along with Health Canada, will co-chair the HEMA Task Force to make health and environment a priority in the Americas, and to synthesize results of the Health and Environment Linkages Initiative.

In addition, we will be working with others to ensure that new trade rules and agreements preserve the flexibility necessary to design and implement effective environmental policies, and that trade liberalization contributes to sustainable development. This will involve attention to negotiations at the World Trade Organization, in the Free Trade Area of the Americas and in other bilateral and regional agreements, including through the process of strategic environmental assessment.

In support of the implementation of the annual program of the CEC, the department will continue to work in several areas of trilateral environmental cooperation, including for example, conservation of biodiversity; management of freshwater and hazardous waste; children's health and the environment; air quality issues; the North American Pollutant Release and Transfer Register (PRTR); renewable energy; trade and environment; and, a 10-year retrospective of the implementation of the North American Free Trade Agreement (NAFTA) and the North American Agreement on Environmental Co-operation (NAAEC).

Environment Canada will continue to work with developing countries in the Americas (Chile and Costa Rica) to implement existing bilateral environmental side agreements, and continue to foster international environmental co-operation to strengthen environmental management with other countries in the hemisphere, including Guatemala, El Salvador, Nicaragua, and Honduras (C-4), and with the Andean Region, and the Caribbean Community and Common Market (CARICOM).

Knowledge, Incentives and Partnerships

The Department and its partners now have a vision for a national environmental information system. Efforts are focused on developing mechanisms to bring together data from numerous sources in an integrated, meaningful way, and ensuring that the federal government, through Environment Canada, delivers on its monitoring, measurement and reporting commitments. Particular attention will be placed on building strong provincial and territorial support for CISE as the Department moves to implementation.

In addition to the implementation of CISE, the Department will continue to invest in Canada's environmental knowledge base through the Canadian Environmental Science Network (CESN), and participation in a number of environmental indicators projects (e.g., NRTEE, Statistics Canada, CEC Children's Health and the Environmental Indicators). In response to the challenges confronting environmental indicators and SOE reporting, Environment Canada will continue working on the development and implementation of a national strategy outlining the future role of environmental indicators and SOE reporting in Canada, and Environment Canada's contribution to that role.

Strengthening our environmental knowledge base will enhance the Department's capacity to respond to emerging issues. To protect the public and to maintain public trust, the Department must have the capacity to respond to emerging issues with appropriate science and regulations. For example, the environmental effects of biotechnology are a significant emerging issue for Canadians and their health and safety. Environment Canada will continue to work with the interdepartmental committee on the Canadian Biotechnology Strategy.

As part of the suite of innovative instruments, the Department will also explore the potential for tax incentives to tackle environmental issues, and plans to introduce focused environmental measures in upcoming federal budgets.

Environment Canada will support the development of a new approach to federal, provincial, territorial and local government partnerships. The passing of the *Species at Risk Act* (SARA) in 2002 provides a good opportunity to develop an approach to partnerships; the Department will work closely with communities, Aboriginal peoples, provinces, territories and others to implement SARA.

4.4.2 Key Result: Well Performing Organization

A well performing organization supported by efficient and innovative services

TRANSFORMING THE WAY WE DO BUSINESS

What is the issue?

Environment Canada needs to transform the way business is conducted from both inward looking and outward looking perspectives. Environment Canada focusses internally on strengthening capacity, and improving accountability and information for decision-making to respond to increasingly complex and urgent environmental concerns, shared governance and increased public demand for transparency. This internal capacity building will support Environment Canada in providing better, more innovative and responsive services to Canadians, having a richer dialogue with the citizens, and improving results for the environment.

What are we doing about it?

Environment Canada's Modern Management Action Plan (MMAP) is centred on transforming the way we work by ensuring that the Department has the management capacity necessary to deliver its policy and program initiatives. As a result, Environment Canada is committing to excellence in five key management areas: responsible spending; managing for results; exemplary workplace; values; and citizen focus. Further, implementation of the MMAP will ensure that appropriate systems and processes are in place to provide managers the tools needed for effective decision-making.

The Department has committed to deliberately integrate approaches to people, knowledge, outreach and service improvement into work done throughout Environment Canada. Initiatives in this area reflect Environment Canada's growing appreciation of the centrality of knowledge to

approaches taken, and our important service role in supporting effective decision-making on the part of Canadians. The goal is to create a work environment that promotes both creative knowledge management and knowledge sharing and encourages innovation to better serve Canadians now and in the future.

What have we achieved?

Cumulative performance story

In the 1990s, fiscal restraint and increasing demands from citizens for better service prompted the Government of Canada to introduce several initiatives under a broad agenda of management change. In 1997, Modern comptrollership was introduced into the federal government to focus management efforts on priority areas for change including sound management of public resources, better performance information, sound risk management, and appropriate control systems. Modern comptrollership also highlighted values and improvements in the government's accountability to Parliament and to Canadians. By early 2000, Environment Canada had joined the Treasury Board Secretariat's modern comptrollership pilot phase.

In the fall of 2000, Environment Canada undertook a departmental managerial capacity assessment, and subsequently launched its Modern Management Action Plan (MMAP) in the spring 2002. The MMAP brings together new and existing departmental management improvement initiatives within a coherent and integrated approach to improving a range of organizational capabilities – from day-to-day decision-making to accountability to Parliament over a three-year time frame. The MMAP will improve the workplace by simplifying management processes and practices, thereby improving the decision-making capacity of management by ensuring timely access to information.

Ultimately, the greatest benefit of the MMAP will be the assurance afforded to Environment Canada's managers and staff at all levels that the Department is using the resources provided in the best way possible to provide excellent programs and services to Canadians in response to their needs.

In early 2002, Environment Canada's senior management team started analyzing how the Department turns its knowledge into concrete action. A goal was set to manage and share knowledge creatively and encourage innovation to better serve Canadians now and in the future. We are transforming the way Environment Canada employees work as individuals, in teams and as an organization. Our efforts are now focussed on framing each of the four priority areas of people, knowledge, outreach and service, and developing implementation plans.

Major performance accomplishments for 2002-2003

Modern Management Action Plan

The 2002–2003 year marked the first year of implementation of the MMAP. To date, MMAP has already drawn a strong commitment from the 15 multi-disciplinary teams created to work on the 38 MMAP initiatives scheduled in 2002-03, and overall, implementation progress is on schedule. One of Environment Canada's initial objectives to address gaps to reach a level of comptrollership equivalent to the Control Level of the Auditor General Financial Management Capability Model is about to be achieved resulting from progress accomplished to date. Progress includes the implementation of an enhanced coding structure, the deployment of an internal control framework, and progress achieved with data management, planning and budgeting processes.

Facilitating Responsible Spending: Environment Canada completed the development of a Common Reporting Structure (CRS) providing the ability to: link resources and program costs to key results. The CRS was fully implemented April 1, 2003. Senior managers now have access to an enhanced level of information that will better support the strategic management of business lines and will provide program and regional managers with a better ability to manage resources. In addition, Environment Canada developed an Internal Control Framework (ICF) as well as a pathfinder approach to monitor the effectiveness of financial internal controls. This tool is in the form of an ICF Self-Assessment Checklist that is being implemented and assessed as a phase-in approach within the Departmental financial community.

Managing for Results: Environment Canada will be finalizing the Results Management and Accountability Frameworks (RMAFs) for two of its four Business Lines – Nature and Weather and Environmental Predictions. This initiative constitutes a part of the infrastructure necessary for managing for results corporately.

Building an Exemplary Workplace: A key management area of Environment Canada's MMAP is building an exemplary workplace, that is based on leading a productive and sustainable workforce, and an enabling workplace.

Environment Canada has demonstrated the critical role of leadership in creating and maintaining an enabling workforce using designated champions and developing networks in support of Diversity Management and the use of Official Languages. 2002-2003 saw the creation of a national symposium of the networks for Aboriginal Persons, Persons with Disabilities and Visible Minorities. In line with the departmental Official Languages Management Framework, the Departmental Official Languages Champion has met with service and regional management teams as part of a national review of the official languages issues and concerns affecting Environment Canada. A team of service and regional Official Languages Champions support the departmental champion and promote the vision of an organization which values bilingualism, promotes the provision of quality services in both official languages as well as institutionalizing official languages in its actions.

As planned under the Enabling Work Environment Initiative, management actively supported employee participation in the spring 2002 survey and disseminated the results. A working group of representatives from all regions and services supported management in analyzing and reporting on Environment Canada results and in formulating strategies for following up on the concerns raised. Further analysis and validation of results was conducted in individual regions/services and work units and initiatives to address issues identified are being incorporated into respective, ongoing workplans. Results, links to regional and national initiatives and tools for managers were made accessible to all employees via the Environment Canada Public Survey Employee Survey site.

Goals – People Plan for Pacific and Yukon Region:

The implementation of this strategic and dynamic three-year action plan for the management of human resources in support of Business Line results is an excellent example of regional leadership taken within Environment Canada to improve the workplace. The People Plan will also serve as a model and source of lesson learned as Environment Canada develops its national plan

Its stated goals are:

- *Employee Satisfaction* - .to achieve and maintain a high level of employee satisfaction and motivation in the workplace through meaningful and challenging work while adhering to our core values;
- *Competent, Sustainable Workforce* - to foster a learning and development organization that promotes career and succession planning and meets our current and future needs;
- *Shared Management of Personnel Processes* - to ensure effective, efficient, transparent, fair, representative and accountable processes to optimize current and future human resources within the Region;
- *Safe and Healthy Work Environment* - to ensure the work environment of the region is safe, productive and fosters balance between work and personal life.

The National Career Development site was launched in May 2002 and provides support to employees' career planning. The site includes self-assessment tools, information on competencies and competency development, goal setting as well as links to resources on career planning and learning and development. The National Employee Orientation site, launched in November 2002, contains a wide range of detailed information about the Department and includes employee check lists, supervisor's guide, and an Introduction to Environment Canada Video.

The Occupational Health and Safety Management Skills Program was developed providing training material for managers and supervisors. In creating and maintaining a Productive workforce, Environment Canada has developed several HR tools to better support and increase the self serve capacity of managers allowing for improved decision-making. The last fiscal year saw the implementation of the Electronic Leave Reporting System, the piloting of the Training Tracker system which will be implemented further this year, and the development of the Overtime Reporting System to be be piloted this year.

In line with its Sustainable Workforce Initiative and in preparation for the many changes brought by the Meteorological Service of Canada (MSC) modernization, a human resources strategy and tools have been developed to manage the MSC transition period., including the establishment of new research initiatives, expansion of outreach activities and development of specialized centres which will render a career in the MSC more satisfying and meaningful. MSC staff will be provided with the time and tools they need to develop and deliver these service improvements, and there will be a new emphasis on strengthening and building research partnerships with scientists in other departments and agencies, and in Canada's academic community.

Applying Knowledge to Better Serve Canadians

Reorganizing to support a new way of working: Several specific actions were undertaken in 2002-2003 to better integrate knowledge and service improvement into our priority strategies. Key actions included:

- Establishment of a new organization, Human Resources and Service Innovation, to bring together expertise, provide new tools, validate and support innovation, and monitor progress as our new agenda takes shape;
- Realignment of Environmental Conservation Service (ECS) and establishment of two new Directorates within ECS to provide a focal point on water, improve policy, and strengthen coordination across the Service;
- Relocation of the National Wildlife Research Centre (NWRC) to a new $15-million building on the campus of Carleton University, featuring $2.2-million in new laboratory equipment, building on the Department's experience in scientific networking and creating opportunities for scientists to mentor students;
- Enhancement the UNEP's Global Environment Monitoring System (GEMS) Water Program headquartered at the National Water Research Institute (NWRI), through Canada's announcement at the WSSD of an additional $1.5-million support over three years; and
- Modernization of Meteorological Service of Canada by securing $75-million over the next five years to co-locate forecast operations with new national research laboratories to benefit Canadians as research and operational staff work side-by-side, and new developments in research are translated into operational applications quickly and effectively. (New outreach programs will bring the MSC staff closer to Canadians, and to weather-sensitive sectors in the economy thereby ensuring MSC services are more closely aligned with client needs).

Statement of Values for Prairie and Northern Region

In support of an exemplary workplace, with particular emphasis on work-life balance, Staff and managers in the Prairie and Northern region formalized their regional values in 2002 in a document entitled, "It's OK to…". This document focuses on issues of balance, such as minimizing the encroachment of work-related responsibilities on personal time (to balance work and home life), and approaches to travel within this large region where travel is common. Ensuring clear direction, priority setting and streamlining efforts including, specific approaches to netiquette (protocol for Internet) are also included, as well as career development and communications feedback. The document has received extremely positive feedback from staff and middle managers across the country and in other government departments.

Improving Service Delivery: With more Canadians on-line each year, it is clear that simply creating Web sites and digitizing information is no longer sufficient. The Department has developed a new innovative approach to service delivery. While remaining committed to delivering timely, accurate and relevant information and services to a full-range of clients and partners, departmental efforts have focused on four key priorities: business transformation, Internet assets, infrastructure (people, processes, tools) and pilot projects. Efforts toward achieving these priorities have been concentrated in the following areas:

- Service improvements including: transforming the Ministerial Correspondence process to improve response times, creating "Your Window on the Weather" to provide easy access to a single weather information source, and creating a Great Lakes portal with partners to provide easy access to a single information source on the Great Lakes environmental issues;
- Innovative use of technology including the development of a web-based Results Management Tool linking operational workplans and resources to long term results;

- Redesigning Environment Canada's Web site, consisting of 80,000 pages, so that interested individuals may access the site regardless of physical or system abilities. As well, now that the site complies with the Common Look and Feel requirements of government, it is now easier to access and navigate;
- Development of work plans for three pilot service improvement initiatives: i) severe weather warnings, ii) precipitation elements in public forecasts, iii) use of toxic import/export permits. Lessons-learned from the pilot initiatives will be used to develop a Service Improvement Framework that will outline strategies and priorities for service improvement to meet the 10% target of increased client satisfaction for key service delivery activities by 2005; and
- Establishment of urban communities pilot projects, to understand local government needs, increase coordination and transfer of knowledge, support and influence local governments, and build partnerships.

A Commitment to Learning: Within a science-based Department addressing long term environmental issues, a key aspect to maintaining quality service, is supporting life long learning, and establishing mechanisms to preserve corporate knowledge. This past year has seen progress in support of learning through:

- Completion of Canada's Framework on Environmental Learning and Sustainability, and presentation at the WSSD;
- Launch of the Environment Canada Mentoring initiative, piloted in Quebec and the National Capital regions, to promote individual and organizational learning;
- Implementation of the Management Development Policy including the accessibility of self-assessment tools and a resource guide for managers on preparing professional development plans for management on the HR site on Environment Canada's intranet;
- Implementation of succession planning for executives, so that programs are in place for senior staff to share knowledge with others before their departures;
- The establishment of the Environment Canada National Youth Network and the Middle Manager's network providing a venue for employees within each group to network, share knowledge and participate in targeted learning sessions;
- Review of existing mechanisms (Associate of Environment Canada and Emeritus Program) in order to develop streamlined methods to access the corporate knowledge of retired employees who wish to give back by sharing knowledge and expertise through flexible arrangements. Such arrangements would allow these individuals to be called upon in an ad hoc fashion and would provide them access to necessary support services required to fulfill needs of the Department; and
- Expansion of Environment Canada's Student Program, to share and develop knowledge on environmental issues, build and renew capacity of workforce, and help build competencies in teamwork and management in staff.

What are the next steps and future challenges?

Environment Canada manages in a context of close public scrutiny and increased demands for accountability, transparency and results. Environment Canada's efforts will continue to focus on supporting internal capacity through full implementation of the MMAP. Development of priorities for the second year of implementation is focusing on advancing modern comptrollership components (integrated financial and non-financial performance information, integrated risk management, appropriate control and values and ethics) grouped under MMAP Responsible Spending and Managing for Results dimensions. Due to their relationship to the

People, Service and Outreach components, the Exemplary Workplace and Citizen Focus dimensions will be addressed through the Knowledge Agenda.

Over the next two years, one major effort that will serve to move knowledge and service improvement initiatives forward, will be pilot projects to more closely examine and understand the information needs of local governments, and to test various approaches to addressing urban environmental issues in a more comprehensive, client-centred fashion. They will test such things as: broad partnerships and collaboration; Environment Canada's services in the context of local government needs; single window approaches; and different decision-making models. Projects will be carried out in the departmental context of improving knowledge management and service innovation and in the broader government context of the Prime Minister's Caucus Task Force on Urban Area.

Appendix A: Consolidated Reporting

A.1 Sustainable Development Strategy

Under the *Auditor General Act*, federal departments and selected agencies were first required to prepare Sustainable Development Strategies (SDSs) in 1997. The initial strategies represented an effort to systematically consider departmental policy, program and operational impacts on sustainable development. Under the Act, there is also a requirement for departments to update their strategies at least every three years.

Environment Canada's second SDS, tabled in the House of Commons in February 2001, covers the period 2001-2003. The Department's updated strategy builds on our strengths while delivering an agenda that provides the basis for long-term solutions to ensure Canada's ecological legacy for future generations.

The strategy reinforces Environment Canada's roles of showing leadership by example and of building capacity and commitment with its partners in all sectors of Canadian society. A key element of the strategy is also Environment Canada's commitment to federal government-wide co-ordinated planning initiatives. The strategy identifies goals and objectives under four areas for making progress on sustainable development: Knowledge for Decision Making; Incentives; Partnerships and Sustainable Communities; and, Managing for Sustainable Development. Under these goals there have been a number of accomplishments in the last fiscal year, a few of which are highlighted below.

Knowledge for Decision-Making

- Canada's Meteorological Service of Canada (MSC) made advances in providing Canadians with information to make informed decisions that support sustainable development. These advances include: new radars; 21 new Aircraft Meteorological Data Relay Program systems; the launching of a new media web portal; upgrades to MSC's web presence; and, improved information resources for winter roads and air quality.
- To enhance the Department's ability to make integrated decisions through the use of new knowledge and decision support tools, the Department is moving into the research design and implementation stage of a multi-disciplinary Sustainable Development Policy Research Program with other federal government departments and the Policy Research Initiative.
- Extensive new knowledge for decision-making was developed in support of the Nature Research Agenda through actions taken towards municipal wastewater treatment; reuse and recycling; the development of a cumulative effects framework and analytical approach for river ecosystems; and, continued development of the Canadian Aquatic Bio-monitoring Network approach to water quality monitoring and assessment in the Atlantic, Ontario and Pacific and Yukon regions.

Incentives

- In support of incentives towards sustainable development, eco-efficiency workshops were held; support towards pollution prevention, water quality and eco-efficiency was provided to Small Medium Enterprises (SMEs); and, results from projects demonstrating GHG reductions in the agricultural sector were presented.

- The Department is building broader support for market-based incentives and economic instruments through work underway with the NRTEE and the OECD and is also continuing to develop specific proposals for measures in a variety of areas including climate change and clean air.

Partnerships and Sustainable Communities

- Helping to promote sustainable communities and partnerships, the Department made a number of improvements to smog forecasts in Canada.
- In support of community capacity-building, a national framework on Environmental Learning and Sustainability has been developed and was distributed at the World Summit on Sustainable Development (WSSD) and widely throughout Canada. An action plan to support its implementation has been produced.
- The Department led the process to prepare a national discussion paper on sustainable communities as part of Canada's preparations for the WSSD.
- Environment Canada's Ecosystem Initiatives have been renewed for another five years to support of partnerships and sustainable communities.
- Hundreds of partnerships for habitat stewardship have been formed under the Habitat Stewardship Program, which helps to protect species at risk and their habitats.

Managing for Sustainable Development

- The focus for 2002-2003 was on the continued development and implementation of the necessary frameworks, tools and critical partnerships that are required to make greening operations a reality. Major initiatives include Federal House in Order (FHIO), Sustainable Development in Government Operations (SDGO) and the continued implementation of an environmental management system (EMS) within our own operations. This year, data collected from the SDGO initiative was merged with data from the FHIO initiative to produce a report which aggregates data on six areas of federal operations: Energy Efficiency/Buildings; Vehicle Fleet Management; Land Use Management; Solid Non-hazardous Waste Management; Water Conservation; Wastewater Management; and, Green Procurement.

◗ More information on FHIO, SDGO and EMS can be found elsewhere in this document and at www.greeninggovernment.gc.ca and www.fhio.gc.ca.

Environment Canada has committed to measure and report on its performance in implementing its SDS on an annual basis. This is the second report on this strategy.

◗ More detailed performance information for the period 2002-2003 has been prepared, visit: www.ec.gc.ca/sd-dd_consult/DPR2003Table_e.html. For the 2001-2002 report, visit: www.ec.gc.ca/dpr/2002/en/app1.htm#anchora1

While each department is required to prepare its own SDS, considerable attention has focused on building support for government-wide initiatives on certain key sustainable development issues since the tabling of the last strategies. Further steps will be required in coming years as the process of building greater coherence and co-ordination across the federal government continues and evolves.

Environment Canada's updated Sustainable Development Strategy for the period 2004-2006 will continue to build on the progress and lessons learned from its previous two strategies. Our path forward is based upon internal consultations and on the

Commissioner of the Environment and Sustainable Development's expectations. It also responds to internal and external audits and reviews. Our emerging approach is to utilize the same general framework as the 2001-2003 strategy, as it has been determined to be of continued relevance. Thus, it is expected the new strategy will be organized around four similar themes: Information for Decision-Making; Innovative Instruments; Partnerships; and, Managing for Sustainable Development.

Environment Canada's updated strategy will more clearly articulate outcomes that we believe will both better enable a successful transition toward sustainable development and also enable Canadians to better judge where progress is being made. This third Strategy will further institutionalize sustainable development in Environment Canada's decision-making processes, while supporting and encouraging others to do the same. The updated Strategy is to be tabled in the House of Commons by December, 2003.

MANAGING SUSTAINABLE DEVELOPMENT: LEADING BY EXAMPLE AND GREENING GOVERNMENT OPERATIONS

The Government of Canada is the largest landowner and employer in Canada, with over 220,000 employees, 23,000 vehicles, 50,000 buildings in over 500 communities across the country, and more than $10 billion annually in purchases of goods and services.

The Government of Canada has the responsibility to reduce its ecological footprint by encouraging sustainable development practices and measures to conserve energy and water, reduce solid waste, improve fleet management, reduce greenhouse gas (GHG) emissions and encourage the purchase of environmentally responsible products. It is also committed to making government greener by encouraging federal employees to integrate sustainable development into decision-making and adopting pollution prevention and environmentally responsible approaches and practices in each of its departments and agencies. Working together, federal employees can reduce the ecological footprint of federal operations, and help the government meet its commitment to become a model of environmental excellence. Environment Canada is helping to achieve this commitment through our leadership on a number of government-wide initiatives, as well as our in-house actions.

Major performance accomplishments in 2002-2003

The focus last year was on the continued development and implementation of the necessary frameworks, tools and critical partnerships that are required to make greening operations a reality. Major initiatives include Federal House in Order (FHIO), Sustainable Development in Government Operations (SDGO) and the continued implementation of an environmental management system (EMS) within our own operations.

Federal House in Order

The FHIO initiative, co-led by Environment Canada, Natural Resources Canada and Public Works and Government Services Canada, is the federal government's plan for meeting its greenhouse gas emission reduction target of 31% below 1990 levels by 2010. It has two main objectives:

- Demonstrate federal leadership in addressing climate change to other sectors of the economy and to the Canadian public; and
- Provide enhanced services to departments and agencies to help them achieve their GHG emission reduction targets through buildings, fleets and the procurement of green power (Green power is electricity generated in a sustainable fashion from renewable energy sources such as wind, water, solar and biomass).

Environment Canada's primary role in FHIO is the management of the Leadership Challenge, through which all federal entities will be invited to undertake their own program of GHG emission reduction actions and to voluntarily report on results. Through the Leadership Challenge, Environment Canada will co-ordinate the sharing of information and best practices, develop tools to help federal entities reduce emissions and facilitate leadership actions in areas such as employee commuting, sustainable business travel and green vehicle procurement.

Through the Federal House in Order initiative, GHG emissions from federal operations have decreased by approximately 5% between 1998 and 2001. These reductions are outlined in the annual FHIO report, Emission Reductions from Federal Operations, to the Voluntary Challenge and Registry Inc., which has achieved Gold Champion Level Reporting designation in 2001 and 2002. Greenhouse gas emission reductions have been the result of initiatives such as increased energy efficiency retrofits in buildings through the Federal Buildings Initiative, and the federal procurement of green power.

Other significant achievements include the development of tools on the FHIO Web site to support the launch of the Leadership Challenge, the promotion of E-10 usage within the federal fleet, and the launch of the Transit Pass Pilot Project in four departments in the National Capital Region. Environment Canada also participated in four carbon neutral conferencing initiatives, such as the G-8 Environment Minister's Meeting, leading to a total reduction of over 4,500 tonnes of carbon dioxide (CO_2). Carbon neutral meetings are meetings where the CO2 used during the conference is offset through purchases of credits in an energy-efficient project. In addition, the Travel Alternatively Program was launched by Environment Canada's Quebec Region to encourage employees to use alternative modes of transportation when commuting to and from work, and to track GHG emissions from employee travel and taxi use. Sustainable Development in Government Operations SDGO is a government-wide initiative aimed at achieving co-ordination of the federal effort to green government operations and the integration of sustainable approaches and actions into day-to-day activities. The SDGO initiative is co-led by Environment Canada, Natural Resources Canada and Public Works and Government Services Canada, and it targets 28 federal departments that prepare a Sustainable Development Strategy (SDS).

SDGO sets out goals for green government in seven priority areas:

- Energy efficiency/buildings;
- Human resources management;
- Land use management;
- Procurement;
- Vehicle fleet management;
- Waste management; and
- Water conservation and wastewater management.

In 2002-2003, work focused on collecting data within Environment Canada's owned facilities for integration in the first government-wide report on greening government operations. Twenty-eight federal departments and agencies that produce Sustainable Development Strategies were invited to provide data on solid waste, green procurement and water — the first time information in these areas was collected on such a broad scale.

Natural Resources Canada led the data collection process on behalf of the SDGO initiative and merged data forwarded by departments/agencies with existing Federal House in Order data to produce the Greening the Federal House report. This report is the first to aggregate data on the status of six areas of federal operations: Energy Efficiency/Buildings, Vehicle Fleet Management, Land Use Management, Solid Non-hazardous Waste Management, Water Conservation, Wastewater Management and Green Procurement. The report was posted on the Greening Government Web site in the summer of 2003.

The Department was also involved in work to stimulate the development and implementation of Environmental Management Systems (EMS) in federal departments and agencies through the SDGO Task Group on Environmental Management Systems. Environment Canada co-chairs with Transport Canada the task group, whose role is to provide strategic and operational advice on the development of EMS in federal departments and agencies.

Environmental Management System

Following the development of an EMS in 15 of the Department's largest owned facilities, work in 2002-2003 focused on ensuring progress on implementation, and to promote the development of an EMS in other facilities.

EMS requirements address eco-efficiency measures such as water conservation, energy use and green procurement, as well as managing environmental risk associated with hazardous materials and contaminated sites. The facilities' environmental management plans (EMPs) also outline a common measuring and reporting structure to allow for comprehensive reporting across the Department. As one of the 11 designated FHIO departments, Environment Canada has also been reporting on its GHG emissions from buildings and fleet, and has begun reporting on SDGO targets last fall 2002.

Environment Canada has been playing an active role in addressing its liabilities and contingent liabilities in order to improve the management system surrounding contaminated sites. The Department performed an internal audit in order to assess the documentation of Environment Canada's liabilities and contingent liabilities with respect

to contaminated sites, as well as the methodology and compilation of those liabilities. Environment Canada has started addressing these concerns and will put processes in place to remedy shortcomings.

Impacts and Benefits

FHIO actions have laid the groundwork for the federal government to meet its GHG reduction targets and illustrates federal leadership on climate change and other environmental issues.

To date, space reductions through downsizing, energy and fuel efficiency programs, and green power purchases have contributed to a total of 24.4% reduction in federal emissions from 1990 levels. The government has also shown leadership in areas such as the promotion of ethanol-blended fuels by commissioning seven new federal E-85 bulk fuelling stations across Canada and increasing the number of E-85 vehicles in the federal fleet to 142 in 2002-2003 from 57 in 2001-2002. The Government of Canada is also continuing to show leadership in areas such as the purchase of green power and to-date has signed agreements in Alberta, Saskatchewan, and Prince Edward Island to purchase wind power.

What are the next steps and future challenges?

Environment Canada will continue to play a leadership role on the FHIO and SDGO initiatives.

Through the Leadership Challenge, the Department has been assisting federal entities in measuring greenhouse gas emissions from their operations and implementing GHG emissions reduction programs. Environment Canada will officially launch the Leadership Challenge during fiscal year 2003-2004 by seeking formal agreements from federal entities to reduce and report on GHG emissions.

Environment Canada will also be working with Natural Resources Canada to increase the number of low-emitting vehicles in the federal fleet, along with continuing to promote and measure blended ethanol fuel usage. The Department will also continue its work with Transport Canada on encouraging the reduction of emissions from employee travel and commuting, including conducting an evaluation of the Transit Pass Pilot Project. In the area of building energy efficiency, funding will be made available to departments for flagship building demonstration projects, showcasing GHG emissions reduction technologies. In addition, the Government of Canada will continue with negotiations for the expansion of green power purchases.

The Department will also be taking part in strategic discussions on the issue of greening government operations. Assistant Deputy Ministers from various departments including Environment Canada have been assigned to drive improved performance in the area of greening government operations, with a specific focus on greenhouse gas emission reductions.

The Department will be working on developing tools/mechanisms to improve the quality and the quantity of data it collects in order to better track its progress in greening

government operations, as well as reviewing the lessons learned from the production of the first roll-up report under the SDGO initiative.

Through the Greening Government Web site, which was established in May 2002 on behalf of the SDGO initiative, the Department will continue providing information on greening government to departments. It will also continue to play an active role in promoting government-wide initiatives in areas such as green procurement and EMS implementation.

- For more information, visit: www.greeninggovernment.gc.ca

In 2003-2004, the Department will continue working on improving the management of its liabilities and contingent liabilities with respect to contaminated sites by developing an interim management plan for contaminated sites, which will be followed by the development a five-year contaminated sites management plan. Also, in 2003-2004, two more Environment Canada-owned facilities will begin the development and implementation of their EMS.

- To learn more about sustainable development practices that can be adopted by industry and others or about the actions the government is taking to green its operations, visit www.greeninggovernment.gc.ca and www.fhio.gc.ca.

A.2 Status of Key Legislative and Regulatory Initiatives

CLEAN ENVIRONMENT BUSINESS LINE

Name of the Regulatory Initiatives	Purpose of Regulatory Initiative	Expected Results	Performance measurement criteria	Results achieved
Clean Air Agenda				
On Road Vehicle and Engine Emissions Regulations	The proposed regulations will ensure Canadian regulations are consistent with the regulations the U.S. Environmental Protection Agency has adopted to implement stringent new standards for 2004-2010 time frame.	Reduce human health impacts (e.g., premature deaths, cases of bronchitis) to Canadians. As the new cleaner vehicles and engines enter the Canadian market, the proposed regulations will result in considerable reductions in air pollutants emitted from the in-use fleet of on-road vehicles.	Compliance with Regulations	As planned in RPP 2002-2003, published in CGII 2 Jan 2003
Regulations Controlling the Release of Substances				
Metal Mining Effluent Regulations	(*Fisheries Act*) - Revoke and replace — To reduce the environmental impact of metal mining discharges to the aquatic environment.	Protect fish, fish habitat, and the use of fisheries resources by ensuring a consistent, maximum quality of effluent discharged to aquatic ecosystems.	Compliance with Regulations	As planned in RPP 2002-3002, published in CGII 19 Jun 2002
Regulations Required to Implement Agreements Canada has, or will be Party to				
Export of Substances Under the Rotterdam Convention Regulations	The main purpose of these regulations is to ensure that chemicals and pesticides subject to the PIC procedure are not exported to parties to the Convention, unless the importing party has provided its "prior informed consent" to the shipment.	These regulations will permit Canada to implement the Rotterdam Convention on the Prior Informed Consent (PIC) Procedure for Certain Hazardous Chemicals and Pesticides in International Trade.	Compliance with Regulations	As planned in RPP 2002-2003, published in CGI 6 Jun 2002. Published in CGII 28 Aug 2002

NATURE BUSINESS LINE

Name of the Regulatory Initiatives	Purpose of Regulatory Initiative	Expected Results	Performance measurement criteria	Results achieved
Species at Risk Act	New legislation introduced for the protection of species at risk and their critical habitats.	Provide a framework to prevent Canadian wildlife species from being extirpated or becoming extinct; provide for the recovery of extirpated, endangered or threatened species; and manage species of special concern to prevent them from becoming endangered or threatened.	The legislation proceeds through the Parliamentary legislative process and is approved.	The *Species at Risk Act* received Royal Assent on Dec 12, 2002 and will enter into force in a phased approach. Most sections of the *Species at Risk Act* will be proclaimed in 2003, with the remaining sections coming into force on June 1, 2004
Species at Risk Regulations	Regulations to be developed to accompany new legislation.	Provide the first set of regulations, including regulations governing the species at risk list and elements of compensation.		An order extending the time limit for COSEWIC to re-assess certain species on Schedule 2 of SARA will be put in place in 2003. Two other orders/regulations are under development, one relating to compensation and the other to amend the SARA Legal List. The intention is to amend the legal list within 9 months of proclamation (Mar 2004). A compensation regulation is in the early stages of development.

A.3 Statutory Annual Reports

A.3.1 International River Improvements Act

Purpose*:* This Act received assent on July 11, 1955. It provides for licensing international river improvements to ensure that Canada's water resources are developed and utilized in the best national interest. The Act does not apply to international river improvements built under the authority of an Act of the Parliament of Canada, or situated within boundary waters as defined in the Boundary Waters Treaty of January 11, 1909, or those constructed, operated and maintained solely for domestic, sanitary or irrigation purposes.

Administration: Regulations for administering this Act were passed by Order-in-Council P.C. 1955-1899 dated December 29, 1955, and amended P.C. 1987-1943, dated

September 17, 1987, and P.C. 1993-764 dated April 20, 1993. The Department of the Environment has administered this Act since June 1971.

Activity: During 2002, no licences were issued under the Regulations of the International River Improvements Act.

The Minister received formal notification from Coast Mountain Hydro Corporation that the proponent considered that the Forest Kerr hydro-electric development on the Iskut River in northwestern British Columbia is excepted from the application of the Act. The Company provided the documentation required under the Regulations, and the Minister concurred with the conclusion that the project was excepted.

During the year, Brilliant Expansion Power Corporation notified the Minister of changes to the project design regarding a proposal to build another powerhouse adjacent to the existing Brilliant dam and powerhouse on the Kootenay River near Castlegar, British Columbia (Brilliant expansion project). The project involves the construction of the 120 mega-watt powerhouse, and a short intake tunnel and tailrace canals to be excavated from rock. The new project concept necessitated additional environmental assessment studies which were essentially completed by year end. The Department was a Responsible Authority for the Canadian Environmental Assessment Act (CEAA) screening study. The CEAA study screening recommendation and decision summary statement, and the IRIA licence are to be finalized early in the next calendar year.

A.3.2 Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (WAPPRITTA)

Purpose: The *Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act* (WAPPRIITA) received royal assent on 17 December 1992 and came into force on 14 May 1996 when the Wild Animal and Plant Trade Regulations to-ok effect. The purpose of WAPPRIITA is to protect Canadian and foreign species of animals and plants that may be at risk of over-exploitation because of poaching or illegal trade and to safeguard Canadian ecosystems from the introduction of species designated as harmful. It accomplishes these objectives by controlling the international trade and inter-provincial transport of wild animals and plants, as well as their parts and derivatives, and by making it an offence to transport illegally obtained wildlife between provinces or territories or between Canada and other countries.

WAPPRIITA is the legislative vehicle by which Canada meets its obligations under the Convention on International Trade in Endangered Species of Wild Fauna and Flora, commonly called CITES.

Administration:

Authorities: Environment Canada administers WAPPRIITA through its national office, where the national CITES management and scientific authorities are located. CITES management and scientific authorities are also located in Fisheries and Oceans Canada for fish and marine mammals and in each province or territory (except Alberta) for provincially or territorially managed species. The Canadian Fo-od Inspection Agency assists Environment Canada by processing CITES documentation for the export of

artificially propagated plants as an attachment to documents required under the *Plant Protection Act*, which it administers.

Enforcement of WAPPRIITA is overseen by the Enforcement Branch in Environment Canada and carried out by five regional offices (Pacific and Yukon, Prairie and Northern, Ontario, Québec, and Atlantic) in co-operation with other federal agencies, including the Canada Customs and Revenue Agency (CCRA), the Royal Canadian Mounted Police (RCMP), and Fisheries and Oceans Canada, as well as with provincial and territorial wildlife agencies.

Agreements with the Provinces and Territories: Memoranda of Understanding (MOUs) to support co-operative management, administration, and enforcement of WAPPRIITA have been established with Saskatchewan and Yukon (1997); Alberta, Manitoba, and the Northwest Territories (1998); and British Columbia and Prince Edward Island (1999). Similar MOUs are currently being negotiated with most of the remaining jurisdictions, including Canada's new territory, Nunavut. Agreements with Ontario (1996), Prince Edward Island and New-Brunswick (1997), Manitoba (1998), Nova Scotia and Québec (2000) have been reached by the Department of Justice to permit ticketing for WAPPRIITA offences under the *Contraventions Act*. Ticketing agreements with other provinces are being negotiated.

Permits: Currently, all permits issued under the Act are to implement CITES. All CITES import permits are issued by Environment Canada, as are all temporary movement certificates for live animals and scientific certificates.

Fisheries and Oceans Canada issues CITES export permits for fish and marine mammals. The provinces and territories (except Alberta for all items and British Columbia for exotic species) issue CITES export permits for items leaving their jurisdictions. Environment Canada issues CITES export permits valid for multiple shipments by certified nurseries of artificially propagated plants and permits on behalf of Alberta and of British Columbia with respect to exotic species.

Regulatory Development: The Wild Animal and Plant Trade Regulations (1996) designate the species protected by the Act and detail the Act's requirements with respect to import, export, and possession of wild species.

Effective January 15, 2000, the Wild Animal and Plant Trade Regulations were amended to allow exemptions from CITES permit requirements for certain personal and household effects, as provided for under Article VII, Paragraph 3 of the Convention, and authorize other measures to improve the administration and enforcement of the Convention in Canada.

Activity: WAPPRIITA requires the Minister to prepare annual reports to Parliament with respect to the administration of the Act during the preceding calendar year. Information concerning the most recent developments related permits, regulatory development, compliance, enforcement and international co-operation will be made available with the completion and tabling of the 2002 Annual Report which is required by January 2004.

- The latest annual report is available at: www.cws-scf.ec.gc.ca/publications/wappa/index_e.cfm

A.3.3 Canadian Environmental Protection Act, 1999 (CEPA 1999)

Purpose: The *Canadian Environmental Protection Act, 1999* (CEPA 1999), which came into force on March 31, 2000, gives the government stronger powers and new tools to protect the environment and human health. The Act emphasizes pollution prevention as the preferred approach to environmental protection, imposes tough new deadlines for action on toxic substances, and places a new emphasis on public accountability and transparency.

The CEPA Annual Report responds to the requirement under CEPA 1999 to present an annual report to Parliament on the administration, enforcement, and research conducted under the Act. The chapters in the report are organized along CEPA 1999's 11 major Parts with each chapter containing an introductory section on the provisions, followed by a detailed description of the CEPA 1999 related activities listed in the DPR and the results achieved for those activities.

Administration: Although both the Minister of the Environment and the Minister of Health have responsibilities under CEPA 1999, Environment Canada is responsible for the administration and enforcement of the Act.

Activity: Activities undertaken pursuant to CEPA 1999 are designed to protect the environment and human health through meeting one or more of the following commitments:

- Decrease reliance on toxic or harmful substances in products and processes;
- Manage waste more effectively;
- Improve Emergency Preparedness, Prevention and Response;
- Prevent or Reduce the Releases of Toxic or Harmful Substances;
- Virtually eliminate PBT releases;
- Reduce trans-border pollution; and
- Improve the environmental awareness and behaviour of Canadian or International Partners.

◗ All necessary information on the commitments listed above and the associated activities can be found in the CEPA Annual Reports or at www.ec.gc.ca/CEPARegistry

A.3.4 Other Statutory Reports

Canada Water Act — proclaimed on September 30, 1970, provides the framework for co-operation with the provinces and territories in the conservation and utilization of Canada's water resources. Section 38 requires that a report on the operations under the Act be laid before Parliament after the end of each fiscal year. The report describes a wide range of federal activities conducted under the authority of the Act, including significant water research, participation in federal-provincial agreements and undertakings, and a public information program.

◗ The most recent annual report is available at the following Web site: www.ec.gc.ca/water/en/policy/legreg/e_legis.htm

Access to Information Act provides a right of access to information in records under the control of a government institution. Information about government institutions is to be published and made available at least annually, including description of each institution's organization and responsibilities, all classes of records under its control (in sufficient detail to facilitate the exercise of the right of access), and all manuals used by its employees. Pursuant to section 72 of the *Access to Information Act*, an annual report on the administration of the Act must be submitted to Parliament by each government institution.

Privacy Act extends the present laws of Canada that protect the privacy of individuals with respect to personal information about them that is held by a government institution and provides them with a right of access to that information. Descriptions of personal information banks held by government institutions are to be published and made available at least annually, including the purpose of the collection, the consistent uses, the retention period and the disposal standards for the personal information. Pursuant to section 72 of the *Privacy Act*, an annual report on the administration of the Act must be submitted to Parliament by each government institution.

A.4 Foundations

Name of the Foundation	Expected Results	Actual Results Achieved	URL Links to Related Information
Canadian Foundation for Climate and Atmospheric Sciences (CFCAS)	Understanding of key climate system processes (stratospheric indicators of climate variations, chemistry and physics of organics in atmospheric aerosol particles, trace gases), including greenhouse gas sources and sinks (nitrous oxide flux emissions, canopy fluxes, atmospheric chemistry). Understanding of key meteorological and atmospheric chemistry processes that have an impact on air quality. Understanding of prediction of extreme and hazardous weather (weather systems, forecasts). Development and improvements of models for weather, air quality (atmospheric volatile organic compounds, persistent organic pollutants) and climate systems adapted to Canada's regional context. Improvement of knowledge about oceans and atmospheric processes that will lead to better marine environment predictions.	CFCAS has increased the resources applied to national atmospheric science and climate issues by encouraging cross-sectoral collaboration. It has increased research capacity through project support for graduate training and postdoctoral research It has successfully stimulated the development of new knowledge in climate and atmospheric sciences; promoted environmental innovation; and supported the training of new researchers who will deal with future environmental challenges. As a result: ▪ Partnerships between university researchers, federal and provincial agencies, universities and industrial bodies have resulted in a dollar-for-dollar match of cash or in-kind resources, for a total impact to date of over $70 million; ▪ 194 graduate students and 92 postdoctoral fellows/research associates work on CFCAS research projects. They provide the po-ol of researchers from which MSC can draw as it re-staffs its research laboratories and its weather and environmental prediction offices and respond to shortages of staff and the need to renew intellectual resources, as identified in its report: 2001 PEER Review Research & Development; ▪ 101 MSC scientists are partners in, or otherwise contribute to CFCAS-funded research initiatives: 39 as co-investigators and 62 as collaborators. University-government partnerships are instrumental in the transfer of results; they also provide results that benefit operational units and policy-makers.	

A.4 Foundations (continued)

Name of the Foundation	Expected Results	Actual Results Achieved	URL Links to Related Information
Canadian Foundation for Climate and Atmospheric Sciences (CFCAS) (continued)		CFCAS is 'leveraging' additional funds, including over $10 million in NSERC funding for major climate initiatives: CLIVAR, SOLAS and FLUXNET-Canada. Partnerships also exist with provincial initiatives such as 'OURANOS', departments of natural resources and private companies. Without CFCAS, the scope of initiatives and the resources applied to them would be severely restricted.	
Sustainable Development Technology Canada (SDTC)	Major reductions in greenhouse gas emissions will result to facilitate reaching Canada's Kyoto objectives. Other EC priorities related to Clean Air will be met with new innovative technologies.	In 2002, SDTC launched 2 funding rounds, and received 500 applications; From these, 7 projects were approved for funding ($6.2M of SDTC funds, for a total project value of $39.2M when combined with leveraged private sector support). No clean air projects were selected for funding in this period. Since the funded projects will commence in 2003, there are no actual results to report to-date. The Government of Canada announced in February 2003 (via the Federal Budget), an additional $250M ($125M through EC and $125M through NRCan, towards the SDTC Fund; The funds will be transferred once a new Funding Agreement, currently under negotiation, is signed.	www.sdtc.ca
The Federation of Canadian Municipalities' Green Municipal Funds (GMF) ***The Green Municipal Enabling Fund*** ***The Green Municipal Investment Fund***	To improve air, water and soil quality, protect the climate, and have a positive impact on the health and the quality of life of Canadians by: Encouraging local environmental action in key sectors including: ▪ Energy and energy services ▪ Water ▪ Solid waste management ▪ Sustainable transportation services and technologies ▪ Sustainable community planning ▪ Integrated community projects. Leveraging private sector contributions to make cities and towns across Canada more energy efficient, at the same time reducing our greenhouse gas emissions. Improving the environmental efficiency and cost-effectiveness of municipal infrastructure.	In 2002-2003, the FCM Board of Directors approved sixty Green Municipal Enabling Fund studies and 14 Green Municipal Investment Fund loans and pilot grants, valued at over $60 million. These projects are expected to leverage an additional $88 million in economic activity. As of June 2003, 226 GMF projects have been approved for a total of $36 million, leveraging over $134 million in total spending It is still too early to measure the impact of the GMIF projects. Results will be reported as projects are completed over the next several years. FCM expects to report concrete results in their 2003-2004 Annual Report. FCM has implemented a Results Management System (RMS) for the GMF that incorporates more than 140 economic, social, environmental and internal administrative outputs and indicators	www.fcm.ca

A.4 Foundations (continued)

Name of the Foundation	Expected Results	Actual Results Achieved	URL Links to Related Information
Clayoquot Biosphere Trust	Local communities and First Nations are engaged in continuing dialogue on developing local solutions towards conservation, sustainable development, and healthy communities Local research, education, and training projects and initiatives that promote conservation and sustainable development are supported. Residents are actively involved in conservation and sustainable development projects that result in tangible, measurable benefits. Increased awareness of range of solutions to challenges that enable residents to respond to specific conservation and sustainable development needs and emerging issues at the regional or ecosystem level. Partnerships and alliances created within the local communities and First Nations that lead to enhanced collaboration among stakeholders and solutions to local environmental and sustainable development challenges.	Friends of Clayoquot Sound: ▪ Completed the "Green Economic Opportunities Project". ▪ Commenced work on the Nuu-chah-nulth Central Language project. ▪ Initiated waste reduction and recycling project in Ucluelet. Committees within Clayoquot Biosphere Trust (CBT) including Culture; Marine and Aquaculture; Community Development and Education; met to facilitate discussion and explore opportunities for collaboration between similar projects with additional community members to be included in discussions. CBT awarded six scholarships for students attending post-secondary education. The Broadband High Speed Internet Project near completion. Clayoquot Alliance for Research, Education and Training (CLARET) in partnership with University of Victoria completed hiring process to fill a Senior Research Associate position based in the community to co-ordinate community priorities in Clayoquot Sound region. The local CLARET steering committee provided direction and innovation to program delivery of CLARET initiatives.	www.clayoquotbiosphere.org/

Appendix B: Financial Information

B.1 Financial Performance Overview

This Section contains a summary of the financial performance of Environment Canada for the fiscal year 2002-2003.

The Department spent $832.6 million in the 2002-2003 fiscal year. This amount is greater than the planned spending identified in the 2002-2003 Report on Plans and Priorities due to additional resources received during the fiscal year.

The change is mostly due to the following items:

- $13.5 million in compensation for salary increases related to the signing of new collective agreements;
- $2.4 million to implement decisions made at the World Summit on Sustainable Development (WSSD);
- $1.9 million to support pesticide regulation;
- $1.8 million for the remediation of the Sydney Tar Ponds and Coke Ovens Site; and
- $1.7 million for the implementation of the Canadian Biotechnology Strategy and for Genomics research.

Within the context of limited financial resources available in the Department, Environment Canada proceeded with a reallocation exercise in 2002-2003 in order to deal with internal financial pressures to meet corporate level priorities, including such items as legal settlements and litigation costs, advancement of the Department's knowledge agenda and increasing support for departmental security.

B.2 Financial Summary Tables

Summary financial data, such as the information presented in Table 1, are displayed using three separate headings. For clarity, these headings are defined as:

- Planned Spending — Amounts shown in the Report on Plans and Priorities in
- 2002-2003;
- Total Authorities — Planned spending plus any additional amounts Parliament has approved for departments to reflect changing priorities and unforeseen events; and
- 2002-2003 Actual Spending — The amounts actually spent for the fiscal year.

Note: Some totals may differ due to the rounding of the figures.

Table 1 Financial Requirements by Authority ($ millions)

This table explains the way Parliament votes resources to the Department.

Vote		2002-2003		
		Planned Spending	Total Authorities	Actual Spending
	Environment Program			
1	Operating expenditures	549.1	588.4	**566.0**
5	Capital expenditures	53.9	51.0	**46.7**
10	Grants and contributions	67.1	77.4	**71.6**
(S)	Minister of the Environment - Salary and motor car allowance	0.1	0.1	**0.1**
(S)	Contributions to employee benefit plans	62.5	72.7	**72.7**
(S)	Spendings of proceeds from the disposal of surplus Crown assets	0.0	0.3	**0.2**
	Total Department	**732.7**	**789.8**	**757.2**

Note: Excludes respendable revenues

Explanation of change from Planned Spending:

The $24.5 million increase in actual spending from planned is mainly due to the following:

Major increases included in the Total Authorities but not in the Planned Spending

	$Millions
Unspent funds carried forward from 2001-2002	17.2
Compensation for salary increases due to the signing of collective agreements	13.5
Funds moved from the previous year for the Climate Change Action Fund and Action Plan 2000	7.7
Funds moved from the previous year for the remediation of the Sydney Tar Ponds and Coke Ovens Site	7.1
Funding received for the remediation of the Sydney Tar Ponds and Coke Ovens Site	6.1
Funding received to implement decisions made at the World Summit on Sustainable Development (WSSD)	2.4
Funding received to support pesticide regulation	1.9
Funding received for the implementation of the Canadian Biotechnology Strategy and for Genomics research	1.7

Major decreases included in the Actual Spending but not in the Total Authorities

Unspent operating funds to be carried forward to 2003-2004 to deal with the continuation of projects	(18.6)
Funds to be moved to subsequent years for the Climate Change Action Fund and Action Plan 2000	(12.4)
Funds to be moved to subsequent years for the remediation of the Sydney Tar Ponds and Coke Ovens Site	(11.4)

Table 2 Departmental Planned versus Actual Spending by Business Line ($ millions)

This table explains the use of resources by business line for the Department.

Business Lines	FTEs	Operating*	Capital	Voted Grants & Contributions	Subtotal: Gross Voted Expenditures	Statutory Grants & Contributions	Total: Gross Expenditures	Less: Respendable Revenues**	Total Net Expenditures
Clean Environment	1,367	203.3	16.0	35.0	254.2	-	254.2	(10.8)	234.4
	-	*218.5*	*16.0*	*37.3*	*271.8*	-	*271.8*	(10.8)	*261.0*
	1,436	**188.8**	**14.5**	**32.3**	**235.5**	-	**235.5**	**(9.3)**	**226.2**
Nature	1,156	159.2	2.9	25.9	188.0	-	188.0	(10.2)	177.8
	-	*167.2*	*2.6*	*29.4*	*199.2*	-	*199.2*	*(10.2)*	*189.0*
	1,281	**156.5**	**2.0**	**28.6**	**187.1**	-	**187.1**	**(6.6)**	**180.6**
Weather & Environmental Predictions	1,698	222.6	33.4	4.2	260.2	-	260.2	(69.3)	190.9
	-	*232.6*	*30.7*	*6.5*	*269.8*	-	*269.8*	(69.3)	*200.5*
	1,785	**223.5**	**29.3**	**6.5**	**259.3**	-	**259.3**	**(58.7)**	**200.6**
Management, Administration and Policy	1,090	117.8	1.6	2.0	121.4	-	121.4	(0.8)	120.6
	-	*134.3*	*1.6*	*4.3*	*140.2*	-	*140.2*	(0.8)	*139.4*
	1,245	**145.5**	**0.9**	**4.3**	**150.8**	-	**150.8**	**(0.9)**	**149.9**
Total									
Planned Spending	5,311	702.9	53.9	67.1	823.8	-	823.8	(91.1)	732.7
Total Authorities	-	752.6	51.0	77.4	881.0	-	881.0	(91.1)	789.8
Actual Spending	**5,746**	**714.3**	**46.7**	**71.6**	**832.6**	-	**832.6**	**(75.4)**	**757.2**
Other Revenues and Expenditures									
Non-Respendable Revenues (i.e., returning to the Consolidated Revenue Fund) (see Table 4 for details)									(9.4)
									(9.4)
									(8.2)
Cost of services provided by other departments (such as Justice Canada for legal services, HRDC for workers compensation, etc.)									(61.5)
									(61.5)
									(63.0)
Net Cost of the Program									784.8
									841.9
									812.0

*Operating includes contributions to employee benefit plans, Minister's allowances and the disposal of crown assets.
** Total Net Expenditures excludes respendable revenues.

Explanation of change from Net Planned Spending: The $24.5 million increase in actual spending from planned is mainly due to the following:	**$ Millions**
Operating: Compensation for salary increases due to the signing of collective agreements Funding received to implement decisions made at the World Summit on Sustainable Development (WSSD) Funding received to support pesticide regulation Funding received for the implementation of the Canadian Biotechnology Strategy and for Genomics research Funds moved to subsequent years for the Climate Change Action Fund and Action Plan 2000 Funds moved to subsequent years for the implementation of the revised Canadian Environmental Assessment Act	**11.4**
Capital: Transfer of resources to Grants and Contributions to appropriately deliver on various programs Adjustment to the amount of resources moved from 2001-2002 for Capital tied to the Meteorological Service of Canada	**(7.2)**
Grants and Contributions: Transfer of resources from Operating and Capital in order to appropriately deliver on various programs Funds moved to subsequent years for the Climate Change Action Fund	**4.5**
Respendable Revenues: Decrease in revenues tied to service level required by NAV CANADA, and in revenues received under the BC Laboratory agreement and the cancellation of the Toxic Substances Research Initiative (TSRI)	**15.7**

Table 3 Historical Comparison of Departmental Planned versus Actual Spending by Business Line ($ millions)

This table provides perspective on how resources are used by the Department across business lines.

Business Lines	Actual 2000-2001	Actual 2001-2002	2002-2003 Planned Spending	2002-2003 Total Authorities	2002-2003 Actual Spending
Clean Environment	164.5	323.4	243.4	261.0	**226.2**
Nature	169.8	177.0	177.8	189.0	**180.6**
Weather & Environmental Predictions	177.0	191.4	190.9	200.5	**200.6**
Management, Administration and Policy	128.8	149.5	120.6	139.4	**149.9**
Total	**640.0**	**841.4**	**732.7**	**789.8**	**757.2**

Note: Excludes respendable revenues

Explanation of change in Actual Spending from 2001-2002 to 2002-2003:
The $84.2 million decrease in spending from 2001-2002 to 2002-2003 is mainly attributable to one-time grants provided in 2001-2002 only. The Federation of Canadian Municipalities received $62.5M for the Green Municipal Investment and Endowment Funds, and the Sustainable Development Technology Canada received $50M to stimulate the development and demonstration of new sustainable development technologies.

Table 4 Revenues by Business Line ($ millions)

This table identifies revenues received by the Department.

Business Lines	Actual 2000-2001	Actual 2001-2002	2002-2003 Planned Spending	2002-2003 Total Authorities	2002-2003 Actual Spending
Respendable Revenues					
Clean Environment	8.5	9.1	10.8	10.8	**9.3**
Nature	7.3	7.3	10.2	10.2	**6.6**
Weather & Environmental Predictions	60.6	62.9	69.3	69.3	**58.7**
Management, Administration and Policy	0.9	0.9	0.8	0.8	**0.9**
Total Respendable	**77.3**	**80.2**	**91.1**	**91.1**	**75.4**
Non-Respendable Revenues					
Clean Environment	0.9	1.1	0.1	0.1	**0.7**
Nature	4.1	4.3	5.0	5.0	**3.5**
Weather & Environmental Predictions	5.3	7.2	4.3	4.3	**3.6**
Management, Administration and Policy	0.7	1.7	-	-	**0.4**
Total Non-Respendable	**11.0**	**14.3**	**9.4**	**9.4**	**8.2**
Total Revenues	**88.3**	**94.5**	**100.5**	**100.5**	**83.6**

Explanation of change from 2002-2003 planned revenues:

Respendable Revenues

The $1.5 million decrease in Clean Environment in 2002-2003 Actual Revenues over the Planned Revenues is primarily due to the sunsetting of the Toxic Substances Research Initiative and the collection of less revenue than anticipated for New Substances Notification.

The $3.6 million decrease in Nature in 2002-2003 Actual Revenues over the Planned Revenues is primarily due to the cancellation of the agreement with the province of British Columbia for the use of Environment Canada's laboratory, and the Toxic Substances Research Initiative.

The $10.6 million decrease in Weather and Environmental Predictions in 2002-2003 Actual Revenues over the Planned Revenues is primarily due to the completion of the renegotiation of the contract with NAV CANADA.

Non-Respendable Revenues

The $0.6 million increase in Clean Environment in 2002-2003 Actual Revenues over the Planned Revenues is primarily related to royalties.

The $1.5 million decrease in Nature in 2002-2003 Actual Revenues over the Planned Revenues is primarily due to lower than anticipated sale of migratory bird hunting permits.

Table 5 Transfer Payments by Business Line ($ millions)

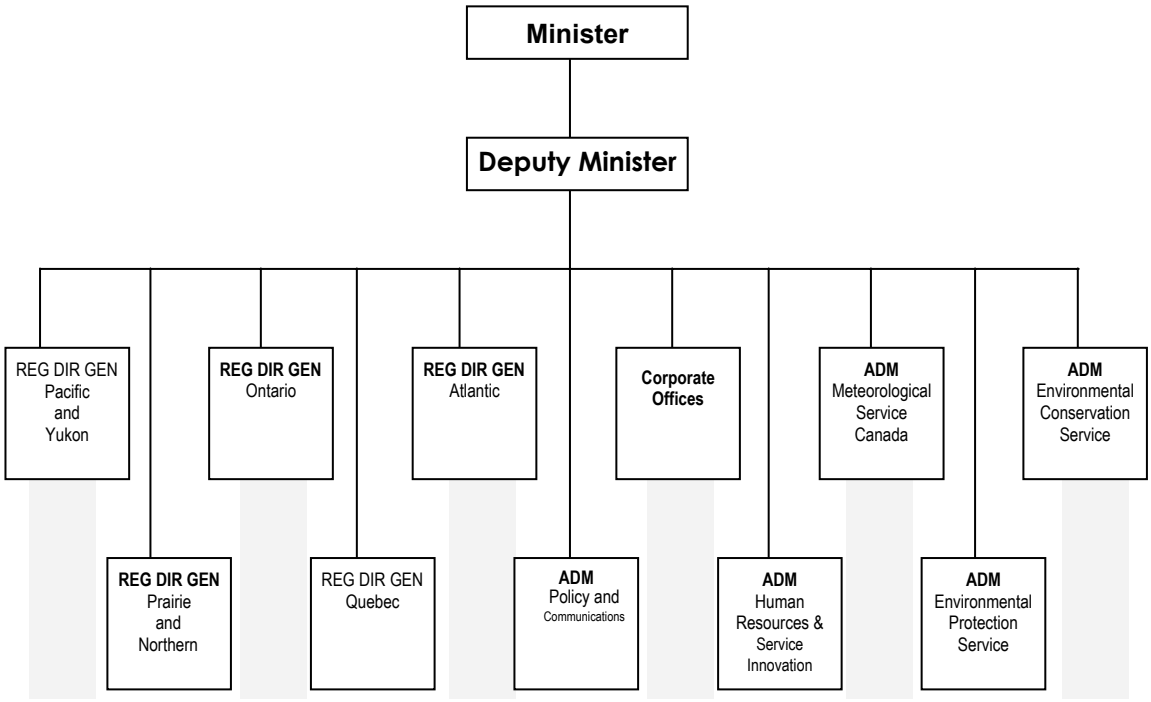
This table explains the way resources are transferred to organizations and individuals to further Environment Canada's programs and initiatives.

Business Lines	Actual 2000-2001	Actual 2001-2002	2002-2003 Planned Spending	2002-2003 Total Authorities	2002-2003 Actual Spending
Grants					
Clean Environment	2.0	114.0	2.0	0.9	**0.9**
Nature	12.0	-	-	0.3	**0.3**
Weather & Environmental Predictions	0.4	-	-	-	**-**
Management, Administration and Policy	-	-	-	-	**-**
Total Grants	**14.4**	**114.0**	**2.0**	**1.3**	**1.3**
Contributions					
Clean Environment	19.9	24.6	33.0	36.4	**31.4**
Nature	22.3	27.6	25.9	29.0	**28.2**
Weather & Environmental Predictions	4.0	5.4	4.2	6.5	**6.5**
Management, Administration and Policy	3.6	4.2	2.0	4.3	**4.3**
Total Contributions	**49.8**	**61.9**	**65.1**	**76.2**	**70.3**
Total Transfer Payments	**64.2**	**175.9**	**67.1**	**77.5**	**71.6**

Explanation of change from planned spending:
To meet overall result expectations, the Department's transfer payments envelope was increased by $6.2M through transfers from Operating and Capital. As well, an amount of $3.5M, tied to the Climate Change Action Fund, was re-profiled from 2002-2003 to subsequent years to meet program delivery requirements. This resulted in a net increase of $4.5M in actual over planned spending.

Table 6 Comparison of 2002-2003 Gross Planned Spending to Gross Actual Expenditures by Organization and by Business Line ($ millions)

This table explains how resources are allocated to both business lines and organizations under the matrix management system.



												Total $ Millions	% of Total
Clean Environment	10.2 **13.1**	9.6 **11.6**	10.9 **11.9**	8.6 **11.3**	24.6 **27.7**	41.2 **31.6**	- **0.3**	- -	7.5 **8.6**	134.1 **111.3**	7.3 **8.0**	254.2 **235.5**	28.3%
Nature	17.3 **20.0**	17.2 **21.7**	26.2 **27.7**	22.2 **27.3**	10.5 **14.2**	- **-**	- **-**	- **4.2**	- **1.0**	1.6 **0.2**	92.7 **70.8**	188.0 **187.1**	22.5%
Weather and Environmental Predictions	17.9 **21.1**	34.3 **44.8**	16.0 **18.6**	12.1 **15.8**	11.0 **14.5**	0.1 **-**	- **-**	- **-**	168.3 **143.4**	- **-**	0.4 **0.9**	26.02 **259.3**	31.1%
Management Administration and Policy	10.8 **15.2**	8.6 **9.8**	9.6 **12.2**	5.7 **6.6**	5.4 **8.2**	29.3 **31.2**	4.6 **6.3**	44.2 **57.4**	1.2 **1.3**	1.6 **0.2**	0.5 **0.7**	121.4 **150.8**	18.1%
Total- $ Millions	56.3 **69.5**	69.7 **87.9**	62.7 **70.4**	48.7 **61.0**	51.6 **64.6**	70.6 **62.8**	4.6 **6.7**	44.2 **61.7**	177.1 **154.2**	137.3 **113.5**	100.9 **80.4**	823.8 **832.6**	100%

Note(1): In 2002-2003, Human Resources and Corporate Services have been merged into one organization called Human Resources and Service Innovation. This table shows therefore a different organization than the one presented in the 2002-2003 Report on Plans and Priorities. Note(2): Includes respendable revenues. Note(3): Normal font: 2002-2003 Planned Spending
REG DIR GEN = Regional Director General, ADM = Assistant Deputy Minister

Table 7 Projects by Business Line ($ millions)

This table identifies the Department's projects and the amount of resources expended.

Business Lines	Current Estimated Total Cost	Actual 2000-2001	Actual 2001-2002	2002-2003		
				Planned Spending	Total Authorities	Actual Spending
Clean Environment						
Ozone - Construction of a Vehicle and Fuel Testing Facility	13.3	-	5.4	4.3	4.3	4.3
Ozone - National Air Pollution Surveillance Network and Canadian Air and Precipitation Monitoring Network (NAPS and CAPMON)	16.8	-	4.8	4.3	4.3	4.1
Weather & Environmental Predictions						
Doppler upgrade - Radar Network Modernization	39.2	8.7	7.8	3.0	3.0	6.1
Modernization of the Climate Observing Program	8.6	0.1	0.9	0.7	0.7	0.7
Weather station construction Eureka N.W.T.	9.9	1.1	0.8	2.0	2.0	0.1
Modernization of Equipment - NAVCAN	2.4	0.6	0.8	-	-	-
Ocean Data Acquisition System (ODAS) - Buoy Payload Replacement	1.7	0.2	0.1	0.1	0.1	-
MSC - Single Window Web Site	2.1	-	1.1	0.9	0.9	1.0
DSAT Replacement Project	1.9	-	0.1	1.1	1.1	0.7
Upper Air Hydrogen Generator Replacement Project	1.8	-	0.1	0.2	0.2	0.0
Aircraft Meteorological Data Relay (AMDAR)	2.1	-	0.1	0.6	0.6	0.4
Canadian Meteorological Centre - Facility Extension	7.2	-	0.8	6.4	6.4	5.4
Sable Island Weather Station	3.0	0.1	0.6	0.5	0.5	0.6
Hydrometric Program	10.0	0.2	2.3	3.1	3.1	3.2
Operational Computer Hardware Infrastructure Renewal	2.4	0.8	0.6	0.2	0.2	0.2
Total Projects	**122.4**	**11.8**	**26.3**	**27.4**	**27.4**	**26.8**

Table 8 Contingent Liabilities

As of March 31, 2003, Environment Canada was facing 24 litigation cases. The total amount of contingent liabilities for the 24 cases is unknown as these cases are in various stages of litigation. It is not EC's policy to comment on their expected outcomes, however they must be recognized as potential liabilities against the Crown.

List of Contingent Liabilities	March 31, 2001		March 31, 2002		Current as of March 31, 2003	
	Number of cases	$ million	Number of cases	$ million	Number of cases	$ million
Claims, and Pending and Threatened Litigation	22	unknown	23	unknown	24	unknown
Total Contingent Liabilities	**22**	**unknown**	**23**	**unknown**	**24**	**unknown**

Table 9 External User Charging ($ millions)

Name of Fee Activity	Fee Type	Fee Setting Authority	2002-2003 Actual Revenue ($000)	Costing Information	Consultation and Analysis	Service Standard	Performance Results
Regulatory Services							
Ocean Disposal Application, Permit & Fees	R	FAA 19.1 (a); CEPA 1999 ss.135(1)	1,373	Application fees are based on estimate of 1992 costs to assess applications for permits. Fee is $2,500 per application for any substance allowed, is administrative and non refundable. Permit fees are based on value of right and privilege which was assumed to be equivalent to the cost of representative monitoring of ocean disposal sites. Approved by TB. Fee is $470/1000 cubic metres of dredged or excavated material. Refunds are possible	Application fees set in 1993, were rolled over in 2001. Regulatory Impact Assessment Statement and multi-stakeholder consultations were conducted before each regulation was enacted. Multi-stakeholder consultations were carried out in 1996-1998 for setting the permit fee. Three year review done in 2003 resulting no change to fee at this time. Consultation report released Aug 2003. For further details see www.ec.gc.ca/seadisposal/regs/min_reg_g2_e.html	Each application permit will be reviewed according to Schedule 6 of CEPA and the Disposal at Sea Regulations. Permit assessment phase involves public notice, application that provides detailed data, scientific review and payment of fees. Each permit will be published in the Canada Gazette. Committed to: annual client meetings to review monitoring plans, conduct representative disposal site monitoring according to National guidelines, produce annual report on activity, produce financial summary of revenues, expenses and value for clients, and report results to London Convention office	Met service standards
New Chemical Notification	R	Sect. 328 of *Canadian Environmental Protection Act* (CEPA) 1999	84	Revenues received equate to 22% of program costs as approved by TB Decision 829041. Full cost recovery is not practical because some services benefit all Canadians; fees are based on specific notification types. Ceilings placed on fees (not to exceed maximum fee in U.S.) to avoid trade impacts	Advisory committee (departmental and non-departmental representatives) met a number of times in 2002-2003 and retained for ongoing consultations. Discussion topics included: costs, revenues, services standards etc. Also published in Canada Gazette and maintained on (www.ec.gc.ca/CEPARegistry/documents/part/nsnr-nsp_con/toc.cfm)	Notification assessments processed within prescribed time periods, typically 45 days. Working internally on new Service Standards Operational Policy document which is planned to be completed during 2003-2004	All new substances notifications processed and assessed within the legislative time period

Table 9 (CONT.) External User Charging ($ millions)

Migratory Bird Program - Hunting Permits and Stamps	R	Migratory Bird Act, 1993	3,037	Cost of program is now exceeding $1.500K annually. Permits: Fees established historically and revised as part of Program Review II in 1998; Stamps: Revenues generated from sale of stamps are provided to Wildlife Habitat Canada (WHC) to fund programs - EC responsible for printing and national distribution	Permits: No recent consultation because revenues still adequately cover Program costs; Stamps: Price of single Stamps are fixed by Regulations. Booklets of Stamps, etc. are sold at a retail price mutually agreed to by both EC and WHC and in accordance with established practices of philatelic industry; TB reapproved contribution agreement in 2002 (see: www.cws-scf.ec.gc.ca/birds/status/index_e.cfm)	Permits: During past 7 years, number of permits sold is on clear decline. This is due mainly to a reduction in clientele; Stamps: WHC's business plan (detailing programs and activities) must support EC's business line goals and be approved by EC before implemented	Purchase of Permits and Stamp units are mandatory for hunters of migratory birds. Purchase of Stamp booklets is voluntary. With funds generated from Stamp revenue, WHC funds several programs and projects that contribute to EC's key result "Biological diversity is conserved". Internal project database identifies key outputs delivered and associated outcomes
Information Products							
Hydrometric Data	P	Ministerial Authority - Contract	4,805	Work done for provincial/territorial partnerships and third parties is evolving to full cost. Nationally at this point, 80% to 85% of full cost is recovered with range in different jurisdictions from 70% to 90%	Consultation is done directly with clients, sometimes in partnership with the provincial representative	Service standards are established by contract	Annual publishing of quality controlled data; moving to on-line real-time quality controlled data
Weather Data	P	Ministerial Authority - Contract	3,510	Partial cost recovery for operational costs (e.g., special access to data). Provision of weather data considered to be partly a product/service for all Canadians	Consultation is done directly with clients (for contracts), sometimes in partnership with the provincial representative. Some products are provided through monthly subscriptions	Service standards are established by contract (Data feed and radar operations are closely monitored. Climate data is quality assured before provided. Clients provided with account representatives for addressing problems and concerns)	Met service standards as established in contract

Table 9 (Cont.) External User Charging ($ millions)

Weather Forecasts/ Products - NAVCAN	P	Ministerial Authority - Contract	14,000	NAVCAN contract renewed for 10 year period. Full cost to be recovered in year 4 due to phasing in of in-direct cost elements that were not in old contract. A full costing exercise was undertaken in 2002-2003 when new contract was negotiated	Negotiations for new contract done in full consultation with Client over course of year	Specified in detail in contract: 1) Performance Measurement System - automated system measures quality of Aviation Weather Observations and Forecasts - monthly report provided to NAVCAN. 2) Data Monitoring Desk - 24/7 operation that monitors accuracy of aviation weather observations. 3) Maintenance services provided for NAVCAN ATS Met Equipment	Met service standards as established in contract
Weather Forecasts/ Products - Other	P	Ministerial Authority - Contract	8,776	For Weather forecast products other than NAVCAN, recovering ~75% to full cost. Moving to recover full cost where product/service does not benefit all Canadians. For telephone services, currently reviewing other delivery options e.g., centralization or will increase fee to fully recover costs. Set fee of $2.99/minute. (1-900 Services)	Mostly contractual agreements negotiated with the clients. During launch of telephone service and price change a few years ago, extensive public consultation. Callers are told of fees every time they call and have option to terminate call	Most products are monitored for accuracy and consistency, many contractual agreements include access to forecasters and service representatives if issues arise	Met service standards as established in contract
Scientific and Professional Services							
Laboratory & Other Scientific Services	S	Ministerial Authority - Contract	3,713	Fees charged represent incremental cost	Since fees charged represent incremental cost and not full costing, client consultation is minimal. For exhaust emissions testing, internal review to determine costs due to specialized activity, comparison to private sector costing when certain similar lab services are available	Calibration is done to exact measurements within specified timeframes agreed to with clients. Use of hydraulics lab facilities are offered on an "as is basis". For exhaust emissions testing, less than 10% error in field and less than 5% in lab	Met service standards as established in contract
Quality Assurance Program (National Water Research Institute)	S	Ministerial Authority - Contract	751	Fees charged represent incremental cost	Since fees charged represent incremental cost and not full costing, client consultation is minimal	Certified reference material is produced and distributed within agreed-upon timeframes	Met service standards as established in contract

Table 9 (Cont.) External User Charging ($ millions)

Water Management Services	S	Ministerial Authority - Contract	4,323	Work done for provincial/territorial partnerships and third parties is evolving to full cost. Nationally at this point, 80% to 85% of full cost is recovered with range in different jurisdictions from 70% to 90%	National Administrator's Table established. Standard agreement drafted which itemizes elements to be cost recovered and deliverables. In addition, there are bilateral discussions between departmental and provincial representatives to refine program changes and deliverables	Service standards were well defined in past when data was only required seasonally or annually but these are being rewritten as all jurisdictions now require real time information	Met service standards as established in contract

Note: The above represents the majority of the Departments' activities that generate revenue from external parties. There are additional activities (such as revenues from accommodations, etc.) that are not included as the revenues generated are not material.

Legend:

P = Products

R = Regulatory

S = Service

CEPA = *Canadian Environmental Protection Act*

Appendix C: Performance Measurement Strategy

Measuring performance is a key element of modern public management. It helps to determine the effectiveness and efficiency of selected strategies, assists in setting priorities, enables more effective demonstration of program impacts, and ultimately is intended to improve departmental performance.

Some aspects of performance have always been measured. Inputs of monetary and human resources are generally tracked, and outputs such as reports produced or inspections carried out have been counted. A major challenge in moving to a results-based management approach is the development of measures of outcomes, that is, of the impacts of programs and services on Canadians.

Challenges for Performance Measurement

Changes in environmental conditions often take decades to become visible. Most environmental issues progress through a cycle that extends 25 years or more. For example, acid rain was known to have significant effects in the 1970s, yet it was not until the mid 1980s that agreements with the provinces and other partners began to provide environmental improvements. Some areas continue to deteriorate and additional controls may yet be required. The length of this issue cycle poses difficulties for performance measurement. If an indicator of the health of aquatic ecosystems had been used, it would have shown declines for many years despite effective action by the Department. However, if measures of intermediate outcomes are used exclusively, they may give insufficient evidence of the improvement to the environment.

Attribution is difficult in the areas of environment and sustainable development because of the number of players that must be involved to successfully implement solutions. In part, this is because jurisdiction is shared across the government and between levels of government. But many issues also require the co-operation of other countries, of Aboriginal people, industry, community groups and individual Canadians. Environment Canada has an important role to play in bringing together these partners and ensuring they work together toward the ultimate objective. The challenge is how to attribute responsibility for success in cases where the benefits of joint action may not have been realized without Environment Canada's intervention, and yet, the Department has certainly not achieved the result on its own.

Precautionary action through changed behaviour and preventative approaches are difficult to demonstrate. A large and increasing portion of Environment Canada's work is devoted to preventing various types of harm from occurring. Such work includes the provision of weather warnings, advice on pollution prevention and eco-efficiency, and the assessment of substances before they enter the marketplace. It is impossible to predict with certainty the effects that would have occurred had such preventive action not been taken. While the wisdom of prevention over remediation is obvious (we need only look to the cost of cleaning up a single contaminated site or spill), the results of action after the fact are easier to quantify.

Good measures of the impacts of scientific and technological research are not yet available. For most issues, a key strategy involves using Environment Canada's expertise to increase understanding of the nature of environmental problems, their causes, and the effects on health, safety, property and the environment. This understanding is crucial in building support for regulatory or other control actions, for engaging domestic and international partners, and for selecting the most efficient and effective solutions. Many organizations that engage in scientific research are struggling with the problem of measuring the impacts of their research efforts.

Many of the final outcomes that are anticipated with the achievement of sustainable development have not yet been clearly defined. While the Government of Canada and other governments around the world have adopted the goal of sustainable development, there is a lack of clarity and consensus as to what the specific outcomes associated with sustainable development should be, and how progress toward this goal might be measured.

Our Strategy

Environment Canada's performance measurement strategy is designed to provide meaningful information to Parliament and the public on progress toward departmental objectives while recognizing the above constraints. Specifically, Environment Canada will:

Continue to develop and report measures of the state of the environment, reduction of harm to human health and safety, and economic efficiency. These represent the ultimate outcomes of Environment Canada's activities – making sustainable development a reality. Since many of the Department's activities serve more than one result, outcome measures are needed to assess the combined effects of many program activities. Environment Canada recognizes that achievements over the long term depend on an ability to find creative solutions that contribute not only to a healthy environment, but also to a prosperous economy.

Develop measures of intermediate outcomes that are more directly attributable to departmental actions. Ultimate outcomes for environmental issues are typically achieved over many years and through the actions of many players. Intermediate outcomes are effects of Environment Canada's programs that are considered necessary for achieving ultimate outcomes. However, they may not alone, provide direct public benefit.

Report measures of outputs where adequate outcome measures are not available. Measures of outputs provide valuable performance information for internal management, such as for assessing program efficiency. However, output measures are not a replacement for measures of outcomes. They do not provide a basis for choosing among alternate strategies, or for determining whether programs are having the desired effects. Development of good measures of program outcomes is continuing. In some cases, however, measures of outputs may need to be used where better measures are not yet available.

Emphasize the integration of performance measures into decision-making. Reporting performance measures externally is important, but the real value in doing so lies in promoting a culture of continuous performance improvement within the

Department. To do this, measures must become part of management decision-making and must be "owned" by program managers. The process of determining valid measures of performance forces a degree of rigour in thinking about program activities that can inform priority setting, and can more sharply focus effort.

Supplement performance measures with rigorous qualitative assessments to provide a more complete picture of departmental performance. Not everything that is important can be measured, and not everything that can be measured is important. Well chosen examples can often convey a better impression of the impact of departmental activities than can any number of measures.

Survey public, client and staff opinions of departmental performance, especially in areas where provision of services is paramount. A significant portion of Environment Canada's programs involve the provision of services to the public or clients (including other federal departments and agencies). One of the best ways to determine whether intended benefits are being achieved is to use opinion surveys and other forms of consultation with the public and clients. A similar approach may also be used for internal administration and other activities that provide services within the Department.

Use peer reviews and special studies to clarify the relationship between departmental actions and outcomes. Peer reviews and other studies provide a much more detailed picture of program performance than is possible through use of a small set of performance measures.

Appendix D: How to Reach Us

Departmental Contacts

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