



ESTIMATES

Natural Resources Canada

Performance Report

For the period ending
March 31, 2001

Canada

Improved Reporting to Parliament Pilot Document

Each year, the government prepares Estimates in support of its request to Parliament for authority to spend public monies. This request is formalized through the tabling of appropriation bills in Parliament.

The Estimates of the Government of Canada are structured in several parts. Beginning with an overview of total government spending in Part I, the documents become increasingly more specific. Part II outlines spending according to departments, agencies and programs and contains the proposed wording of the conditions governing spending which Parliament will be asked to approve.

The *Report on Plans and Priorities* provides additional detail on each department and its programs primarily in terms of more strategically oriented planning and results information with a focus on outcomes.

The *Departmental Performance Report* provides a focus on results-based accountability by reporting on accomplishments achieved against the performance expectations and results commitments as set out in the spring *Report on Plans and Priorities*.

The Estimates, along with the Minister of Finance's Budget, reflect the government's annual budget planning and resource allocation priorities. In combination with the subsequent reporting of financial results in the Public Accounts and of accomplishments achieved in Departmental Performance Reports, this material helps Parliament hold the government to account for the allocation and management of funds.

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Foreword

In the spring of 2000 the President of the Treasury Board tabled in Parliament the document “Results for Canadians: A Management Framework for the Government of Canada”. This document sets a clear agenda for improving and modernising management practices in federal departments and agencies.

Four key management commitments form the basis for this vision of how the Government will deliver their services and benefits to Canadians in the new millennium. In this vision, departments and agencies recognise that they exist to serve Canadians and that a “citizen focus” shapes all activities, programs and services. This vision commits the government of Canada to manage its business by the highest public service values. Responsible spending means spending wisely on the things that matter to Canadians. And finally, this vision sets a clear focus on results – the impact and effects of programs.

Departmental performance reports play a key role in the cycle of planning, monitoring, evaluating, and reporting of results through ministers to Parliament and citizens. Earlier this year, departments and agencies were encouraged to prepare their reports following certain principles. Based on these principles, an effective report provides a coherent and balanced picture of performance that is brief and to the point. It focuses on results – benefits to Canadians – not on activities. It sets the department’s performance in context and associates performance with earlier commitments, explaining any changes. Supporting the need for responsible spending, it clearly links resources to results. Finally the report is credible because it substantiates the performance information with appropriate methodologies and relevant data.

In performance reports, departments strive to respond to the ongoing and evolving information needs of parliamentarians and Canadians. The input of parliamentarians and other readers can do much to improve these reports over time. The reader is encouraged to assess the performance of the organization according to the principles outlined above, and provide comments to the department or agency that will help it in the next cycle of planning and reporting.

This report is accessible electronically from the Treasury Board of Canada Secretariat Internet site:

<http://www.tbs-sct.gc.ca/rma/dpr/dpre.asp>

Comments or questions can be directed to this Internet site or to:

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Natural Resources Canada

Performance Report

For the period ending
March 31, 2001

Ralph Goodale
Minister of Natural Resources Canada

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I Minister's Message

I am pleased to present the Performance Report for Natural Resources Canada (NRCan) for the period ending March 31, 2001.

Canada's natural resources sector is among the most productive and high-tech in the country, supporting our dynamic economy, a healthy environment and strong communities.

In the latest *Speech from the Throne*, the Government of Canada committed itself to building a stronger and more inclusive Canada, and to securing a higher quality of life for all Canadians. It also affirmed that the good management of our natural resources directly benefits Canada's economy and quality of life.



Ralph Goodale
Minister of
Natural Resources Canada

A Vision for Canada's Natural Resources Sector

In the new millennium, Canada must become and remain the world's "smartest" natural resources steward, developer, user and exporter – the most high-tech; the most environmentally friendly; the most socially responsible; the most productive and competitive – leading the world as a living model of sustainable development.

A major consumer and creator of advanced technology, the natural resources sector is a key driver of Canadian innovation. Innovation has enabled the sector to raise its productivity and hold its ground against global competitors. But simply maintaining our position is a luxury we can no longer afford. In today's world, industries that are not gaining ground are increasingly apt to be losing it. To win the race for rapidly emerging global markets, Canada's resource industries must relentlessly strive to innovate faster, better and smarter.

NRCan, through partnership and research and development, is helping the sector be innovative and make wise use of our resources, contributing to a better quality of life today and tomorrow. The attached Executive Summary provides a snapshot of our key accomplishments over the past year. This work is in keeping with objectives set forth in the *Speech from the Throne, Results for Canadians*, and the *Social Union Framework Agreement*.

Of the many natural resources with which NRCan is associated, the most important is our people. I am proud of what they have achieved and I am particularly gratified by the external recognition of NRCan employees and teams. As we help to ensure the sustainable development of Canada's natural resources, the people of NRCan will continue to work with all Canadians to enrich our way of life and enhance our place in the world.

Ralph Goodale

Minister of Natural Resources Canada

Executive Summary

This report contains financial and non-financial performance information by strategic outcome. It presents our key accomplishments in a storyline format. As well, it reports in a quadrant format on the eleven performance indicators NRCan committed to report on in the 2000-01 Report on Plans and Priorities. A summary of this information is shown below. Information on other departmental accomplishments is available on the NRCan web site at www.nrcan.gc.ca and the Sustainable Development Strategy (SDS) web site at <http://www.nrcan.gc.ca/dmo/susdev/>. The Department's SDS goals are fully integrated with its strategic outcomes.

Strategic Outcome #1 – To provide Canadians with information to make balanced decisions regarding natural resources – One of NRCan's goals is to help Canadians achieve a better understanding of the evolving and complex nature of the economic, environmental and social factors affecting Canada's natural resource development and use, and to integrate these factors in a form that allows balanced decision-making. The Department contributes to this goal through its ongoing pursuit of knowledge through world-class scientific research, programs and policy initiatives.

Key accomplishments for 2000-01 include NRCan On-Line and GeoConnections infrastructure development; the development of new projects, with partners, under Geomatics for Informed Decisions, which is an investment program that consolidates Canadian expertise in geomatics and geoscience; promoting public education and outreach on climate change, as well as renewable energy programs, technologies and information tools; guiding national sustainable forest development through initiatives such as Canada's Model Forest Program, Forest 2020 and the development of forest management criteria and indicators; and promoting national and international consensus building and cooperation through the implementation of strategies and collaborative activities within the Mines Ministries of the Americas Conference.

Strategic Outcome #2 – To provide Canadians with sustainable economic, social and environmental benefits derived from natural resources for present and future generations –

NRCan, in collaboration with clients and stakeholders, is focusing on three primary challenges: to demonstrate that Canada's natural resources are being managed responsibly so that Canada can enhance its trading position and maintain its national and international reputation as a world leader in sustainable development; to enhance industry competitiveness in a global economy through market diversification and the development of innovative products; and to support rural and Aboriginal communities through programs and targeted projects designed to enhance their economic and social well-being.

Key accomplishments for 2000-01 include launching Targeted Geoscience Initiative projects in nine provinces and three territories; pursuing emerging opportunities in the North American energy market; yielding benefits from the trade missions to Asia and Europe; promoting community and Aboriginal business growth through the Sustainable Communities Initiative and

the First Nation Forestry Program; developing advanced automation technologies in the mining industry; and promoting investment in mineral exploration.

Strategic Outcome #3 – To provide Canadians with strategies that reduce environmental impacts in the natural resources sector – As a pillar of sustainable development, environmental protection is a driver for the Department's programs and policy research. Initiatives in this area help to protect Canada's land, air and water, improve our quality of life and demonstrate to the world our commitment to environmental stewardship and sustainable development.

Key accomplishments for 2000-01 include addressing the climate change challenge through the development of Action Plan 2000 on Climate Change as well as programs, technologies and international representation; promoting energy efficiency initiatives in government, industry, the residential and transportation sectors, businesses and institutions; and implementing a sustainable development approach to the production of cement and concrete.

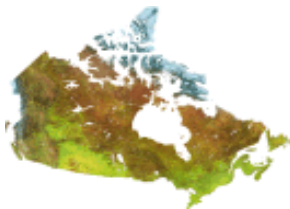
Strategic Outcome #4 – To provide Canadians with safety and security in the natural resources sector – The Department supports three main areas of public safety and security. These are providing timely and effective responses to both human-induced and natural disasters in the form of technical advice, funding and technology support, maps, charts and satellite imagery; playing an important role in securing national, territorial and economic sovereignty at a time when the traditional notion of sovereignty is being challenged and redefined by globalization; and providing the policy framework and technical expertise necessary for the development of safety and security regulations in the natural resources sector.

Key accomplishments for 2000-01 include mitigating the impacts of natural disasters; addressing nuclear fuel waste management in Canada; providing expertise on explosives regulations and technology; and providing a national framework for geospatial referencing in Canada.

Strategic Outcome #5 – To provide Canadians with a department that is efficiently and effectively managed – NRCan recognizes that the attainment of sustainable development goals requires good governance. This is particularly true in the current operating environment where the continued demand of allocating scarce resources and obtaining better value for money is leading the government and NRCan to search for innovative approaches to results-based management and accountability.

Key accomplishments for 2000-01 include advancing viable approaches to modern management by building a strong and diverse workforce; actively managing our real property infrastructure; strengthening our information management/information technology; raising awareness of occupational safety and health; sharing expertise and advice in more than 100 internal and external environmental assessments; and promoting eco-efficiency.

II Departmental Performance by Strategic Outcome



Strategic Outcome #1 - To provide Canadians with information to make balanced decisions regarding natural resources.

Expenditures 2000-01: \$198.2M

Short to medium-term objectives	Performance Indicators	Departmental Priorities for 2000-01	Speech from the Throne Themes
<p>Easily accessible and integrated knowledge on the state of Canada's landmass and natural resources, and the economic, environmental, and social dimensions of their use.</p> <p>Greater national and international cooperation and consensus on sustainable development issues, policies, goals and actions.</p> <p>Fiscal, regulatory and voluntary approaches that encourage the sustainable development of natural resources.</p>	<p>User satisfaction with relevance, accessibility and quality of information.</p> <p>Public awareness of the importance and relevance of the natural resources sector, its issues, and NRCan's S&T.*</p> <p>Adoption of NRCan-supported technology and practices.</p> <p>Participation in, and influence on, national and international multi-stakeholder approaches to sustainable development issues.</p> <p>Degree of leveraging by NRCan from shared S&T projects.</p> <p>Participation in, and influence on, fiscal, regulatory and voluntary sustainable development initiatives.*</p> <p>Influence of NRCan's S&T-based recommendations on regulatory regimes.</p>	<p>Resource Innovation</p> <ul style="list-style-type: none"> Improve access to resource knowledge and information for enhanced service to Canadians. <p>Consensus Building</p> <ul style="list-style-type: none"> Promote national and international consensus building and cooperation. <p>Work Opportunities</p> <ul style="list-style-type: none"> Enhance development of skills of Canadians, including Aboriginal peoples, related to natural resources and land development, use and management, which would increase their economic opportunities. <p>Policy Advice</p> <ul style="list-style-type: none"> Provide the Minister of Natural Resources with professional, unbiased, analytically sound and effective assessments and recommendations on natural resource policy proposals and issues based on the public interest and for the well-being of Canadians. Continue to develop strategic partnerships to carry out our mandate. 	<p>Creating Opportunity</p> <ul style="list-style-type: none"> Innovation Connecting Canadians <p>Sharing Opportunity</p> <ul style="list-style-type: none"> Clean environment

* Performance information on these specific indicators is presented in a quadrant format on pages 13 and 14.

What we have accomplished....

The power of creating and sharing knowledge – At NRCan, sharing knowledge has been part of our culture since the Department's beginnings more than a century and a half ago. The Department was established in 1842 to discover and inform Canadians about their vast new country's rich resources. We want to share knowledge about all of Canada's natural resources – be it a rock sample, a satellite image, a database or a map layer.

NRCan On-Line (NOL) is an exciting new initiative that will revolutionize how the Department delivers its programs and services to



Canadians and how Canadians can access and use information on resources via the Internet.

NOL is building on the successes of its predecessor program, *ResSources*, a pioneering initiative in the Department's knowledge management agenda (<http://www.nrcan.gc.ca/nrcanonline/>). NOL is laying the foundation for NRCan's participation in the Government On-Line (GOL) initiative.

NOL enables NRCan to integrate natural resources information and knowledge across scientific and policy disciplines as well as across government departments and all levels of government. It does so with the vision of embracing all Canadians whether in our workplace, in our homes or our schools.

During fiscal year 2000-01, the following key initiatives were undertaken to advance NOL projects within NRCan while supporting the GOL agenda:

- developed a prototype of the Discovery Search Engine, the Tagger and the Directory of Expertise (\$350K approximately);
- completed the Geographic Information System Rural Health Project (\$228K) with a number of important lessons learned and documented for future potential application;
- completed various projects, e.g., National Atlas, Schoolnet, Mapping for Reliant Communities, and interactive web-based geographical policy tools (\$150K);
- complied with the government's Common Look and Feel Initiative (\$135K);
- fostered the development of mapping-related tools for the blind and visually impaired to produce a Tactile Atlas of Canada (\$73K); and,
- developed a results-based management and accountability framework to contribute to ongoing performance measurement and to the periodic evaluation of NOL.

In the same line of work, the Department continued with the infrastructure development of GeoConnections, a federal-provincial-territorial initiative to provide on-line geographic information (\$60 million over five years). This world-leading geospatial information technology infrastructure is also a component of NOL/GOL. Over the past year, significant accomplishments have been made in determining the technologies, framework data, standards, protocols, policies and maintenance procedures for this national partnership initiative. How important is this to Canadians? Very. It means that a user-friendly geospatial Internet service will provide on-line access to a wealth of information that can be applied to various social and environmental applications, for example, 9-1-1 emergency response. More information can be found at <http://www.cgdi.ca>.

Meeting the geospatial challenge – GEOIDE (Geomatics for Informed Decisions) is a research and development (R&D) investment program that is currently consolidating Canadian expertise in geomatics and geoscience; this is vital information for community decision-making.

As the main partner in the GEOIDE Network of Centres of Excellence, NRCan contributes up to \$1 million annually in direct and indirect funding. GEOIDE has a very broad base of support in the geomatics and geoscience community with a balance of industry and government support for university research and technology development. Collaborative research with NRCan ranged from introducing advanced 3-D visualization into geological mapping to developing synthetic vision techniques for search and rescue under severe weather conditions.

New projects in 2000 extended geomatics research into the social sciences, notably in determining the use and value of marine boundary information through a \$100K contribution to a network based at Dalhousie University, and an additional \$200K investment in making geomatics fundamental to the knowledge infrastructure for community sustainability. Researchers at the University of British Columbia, Simon Fraser and the University of Victoria have now been able to introduce earth sciences ecological information into their socio-economic models for land use. This information fusion is designed for global application with immediate opportunities in major urban centre markets.

NRCan scientists are focusing on the development of a digital library to provide information on natural hazard and natural area disruption consequences of economic growth

and urban development alternatives. For example, university and industry GEOIDE partners in this project are developing interactive tools and scenarios based on the digital library, which, in turn, allow citizens to share experiences and concerns with town planners and politicians on development decisions that affect their daily lives.

Reaching out to Canadians on energy initiatives – Recognizing that climate change may be the most significant environmental and economic issue that the world has ever faced, NRCan promotes initiatives that have strong climate change education components. To help Canadians better understand the cause of climate change and what they can do to make a difference, NRCan provides them with relevant information through its Public Education and Outreach (PEO) program.

Public education and outreach counts...

- two millions hits on the Climate Protection Solutions Internet clearinghouse;
- more than 700 people in 32 workplaces committed to “Count Me in” workplace workshops;
- more than 4,000 homes visited to promote residential energy efficiency;
- 72 municipalities, representing 60 percent of the Canadian population, became members of the “Building for Success” software to complete greenhouse gas inventories; and
- PEO received recognition from the International Institute for Sustainable Development for its Inuit Observations on Climate Change video and by the Organization for Economic Cooperation and Development (OECD) for its environmentally sustainable transportation program for secondary schools.

Through a climate change web site www.climatechange.gc.ca, a 1-800-O-Canada information line, exhibits and information materials, targeted advertising and tracking public awareness levels, PEO motivates

behavioural change among community groups, municipal governments, youth, educators, business and industry, media and the general public in areas such as transportation, energy efficiency and science outreach. Over the past three years, PEO funded 152 national and local projects, for a total of \$51 million from both the Climate Change Action Fund (CCAF) and partners. All projects are implemented in partnership with provincial and territorial governments, youth, educators, business and industry, and environmental groups.

Renewable energy is another important component in addressing climate change. NRCan's Renewable Energy Deployment Initiative (REDI) supports the development and implementation of market strategies for renewable energy systems in cooperation with industry associations and other partners. An evaluation of REDI for the first two years of the program (1998-99 and 1999-00) indicated that the initiative had not generated the level of response expected. However, in the third year of operation alone, more projects were completed than in the first two years, demonstrating a great increase in awareness. In 2000-01, 24 renewable energy projects were completed, representing \$1.9 million in investments and \$331K in REDI contributions. The evaluation report recommended that marketing activities be continued and that performance targets be developed.

As well, in collaboration with the remote communities program in Varennes, REDI facilitated numerous projects in Canada's remote communities, including the installation of a Solarwall™ for a recreation centre in Ft. Smith, an elementary school in Yellowknife, Northwest Territories, and an apartment building in Iqaluit, Nunavut; and solar water heaters for a demonstration home in Kahnawake, Quebec and for a municipal pool in Haines Junction, Yukon. The Yukon

remote communities partnership was established and NRCan sponsored a Canada-Yukon Energy Solutions Centre in Whitehorse. More information on REDI is available at:

http://nrml.rncan.gc.ca:80/es/erb/reed/progdesc_e.htm.

Tools for increased awareness

RETScreen International (<http://www.retscreen.gc.ca>) is a renewable energy awareness, decision-support and capacity building tool developed by NRCan with the contribution of more than 85 experts from industry, government and academia. It has enabled the evaluation of energy production, life-cycle costs and greenhouse gas emissions reductions for various types of renewable energy technologies. RETScreen is used in more than 180 countries, with 14,000 current users and 150 new users each week.



CanREN, the Canadian Renewable Energy Network (<http://www.canren.gc.ca>) was created through the efforts of NRCan and its stakeholders to increase the understanding of renewable energy and to accelerate the development and commercialization of renewable energy technologies. It provides one-stop shopping on the Internet for information on renewable energy covering resources, technologies, policies, programs, projects, and statistics for hydro, bioenergy, wind, solar and geothermal energy. It presents Canadians with the knowledge and support they need to make renewable energy part of their everyday lives.

In addition to reaching out to Canadians with information on issues that matter to them, NRCan, through its Program of Energy Research and Development (PERD), funds R&D projects in collaboration with other federal departments. One such initiative has looked at the impact of ice on offshore floating oil production and storage platforms. The

outcome of this research will help companies make more informed decisions thus improving the safety of personnel, increasing production and reducing expenses incurred from shutdowns. For example, research has determined that one company can now safely continue production on offshore structures until 80 percent ice cover is reached, instead of 50 percent, thus extending the operating envelope of structures under such conditions. As well, NRCan developed with the private sector a vision for Canada's energy R&D needs to 2020 to address current and emerging priorities and to help guide PERD activities in the future.

Canada's Model Forest Program: sharing and delivering our forest values

– Canada's five year Model Forest Program (1997-2002) was designed to develop and demonstrate innovative, science-based approaches to sustainable forest management on public and private lands premised on consensus-based community partnerships. In collaboration with some 400 forest partners representing diverse interests, the program is delivered through a national network of 11 model forests covering a geographical area of almost nine million hectares. Over 1000 projects have been supported since its inception in 1992 and the following represent some achievements in these areas.

In terms of local level achievements, the Bas-Saint-Laurent Model Forest (BSLMF) had implemented a forest tenant farm model which demonstrated how forest farms can generate socio-economic and environmental benefits for rural communities through sustainable forest management. On the west coast, the community capacity building initiatives in the Long Beach Model Forest have contributed to skills development within First Nation communities including major spin-off benefits

such as increased employment opportunities for First Nation youth and the pursuit of advanced education. Some 130 participants, including many Aboriginal youth, have benefited from these initiatives.

Did you know?

- Nationally, the model forest network achieved consensus on the development of local level indicators for sustainable forest management and was cited for its success in the Auditor General's November 1999 Report.
- The network developed approaches to increase Aboriginal involvement in the sustainable forest management discussions.
- The Standing Committee on Natural Resources and Government Operations' June 2000 Report recognized the importance of the program and recommended its continued support.
- In June 2000, the Foothills Model Forest, in Alberta, received the Premier's Award of Excellence in recognition of its partnering efforts over a period of eight years.

The McGregor Model Forest, B.C. developed an integrated watershed assessment model to help public participation in forest harvesting decisions, facilitated the development of a computerized wildlife threat rating system, and developed a national computerized wildfire threat rating system. The BSLMF developed a successful voluntary wetland conservation program for private lands. This project helps to educate woodlot owners on the importance of protecting wetlands, and seeks their voluntary cooperation in wetland conservation. The Lake Abitibi Model Forest provided forest community decision-makers with the ability to estimate key socio-economic impact data based on anticipated changes in benefits from the forest. The Western Newfoundland Model Forest had developed a sustainable forest management program for front-line forest workers. The initiative, which provides forest workers with a foundation in environmental awareness and

harvesting sensitivity, has been delivered to all forest workers employed by pulp and paper companies in the province. As a result of S&T research into alternative and environmentally-friendly tree spraying programs, the Manitoba Model Forest developed a major forest management manual entitled “*Manual for Environmentally Responsible Forestry Operations in Manitoba*” which has been adapted by the Lake Abitibi and Waswanipi Cree Model Forests for use in Ontario and Quebec respectively.

The program evaluation report, to be completed in September 2001, will be used by the Department to support program renewal discussions. Additional information on this program can be found at the following web-site: <http://www.modelforest.net>.



A vision for the mining industry –

During 2000-01, a key departmental objective was to build national and international consensus and cooperation on sustainable development. To fulfill this objective in the western hemisphere, the Department led the organization of the Annual Mines Ministries of the Americas Conference or *Conferencia anual de ministerios de minería de las américas* (CAMMA). CAMMA is a ministerial-level mining policy forum, which

facilitates the development of common approaches, the exchange of information and collaboration on common issues among mining ministries in the Americas and the Caribbean. With the support of the Canadian International Development Agency and in cooperation with the CAMMA Coordinating Committee, NRCan developed a program which addressed sustainable development issues. Working with twenty-three member countries in the Americas and Caribbean, NRCan also led the discussions of market access related to minerals and metals, in direct support of the Department’s objective to maintain and expand access to international markets for Canadian resource-based products, knowledge, technologies and services.

In October 2000, NRCan hosted the fifth CAMMA attended by 19 of 23 member countries. The first ever CAMMA Terms of Reference, proposed by Canada, were adopted at the conference. NRCan also hosted a CAMMA workshop on mining and communities in 2000-01. The workshop’s purpose was to promote a multi-stakeholder dialogue to expand collaborative projects between CAMMA and stakeholders.

CAMMA has served to advance social and economic issues affecting local communities in the western hemisphere, and has contributed to the development of common sustainable development approaches and policies in member countries. CAMMA has also served to link science and policy, another departmental objective, by underscoring the importance of sound science in government decision-making and the safe use principle for minerals and metals.

The benefits of CAMMA have spilled over to regions beyond the western hemisphere. NRCan has promoted CAMMA’s framework

to other fora such as the Asia-Pacific Economic Cooperation, international non-ferrous study groups and the Organization of American States.

CAMMA's Mission Statement

Recognizing the important contribution of mining to the development of our respective economies, acknowledging the role that the sustainable development of minerals and metals can have in alleviating poverty and improving the well-being of our communities while minimizing the environmental impacts of mining development, We, as Mining Ministries in the Americas, are committed to supporting and promoting the implementation of policies which take into account environmental, social and economic considerations in government decision-making, supported by scientific-based knowledge, and which will foster the development, promotion, sound management, and safe use, of minerals and metals in the Americas.

Communicating our knowledge well – NRCan is working to increase public knowledge and awareness of natural resource-based industries' sustainable development performance and to promote best practices of corporate social responsibility among these industries. Information on this important initiative can be found on page 13.

Using our influence to promote sustainability in the mining sector – Acidic draining has long been recognized as the largest environmental liability facing the Canadian mining industry, and to a lesser extent, the public through abandoned mines. The Mine Environment Neutral Draining (MEND) Program was the first international multi-stakeholder initiative to develop scientifically-based technologies to reduce the effect of acidic drainage. More details on this important program can be found in a quadrant format on page 14.

Forest 2020: a new vision for Canada's forest sector – In August 2000, the Minister, in conjunction with the Canadian Council of Forest Ministers (CCFM), announced Forest 2020 – the solution-based concept designed to address Canada's need to balance the myriad of economic, social and environmental pressures and demands placed on Canada's forests.

The concept, which supports Canada's National Forest Strategy (1998-2003) and the Canada Forest Accord, represents an integrated approach of bringing diverse forest interests together under an umbrella solution so as to reduce the economic pressures to harvest untouched natural growth forests, while enhancing timber production on suitable lands that are already in the second growth category, and for the first time in Canada on a large scale, new forest plantations on land that is not currently growing trees. To help pursue this vision, the Department established a six member Secretariat to support the work of the intergovernmental CCFM Forest 2020 Task Force and to lead the public dialogue process.

In 2001, the Minister and a core group of CCFM Ministers, received strong support for the Forest 2020 concept from international forestry experts, leaders from environmental groups, and senior executives from major forest companies. As well, fourteen focus groups in seven locations were consulted across Canada. The response was highly favourable, with prevailing feedback being positive support for the concept's continued development.

The Forest 2020 concept was also presented to major forest interest groups across Canada such as The Canadian Federation of Woodlot Owners, the Sierra Club of Canada, the National Aboriginal Forestry Association, and

mayors from ten forest resource communities across Canada. Numerous other Aboriginal, environmental and conservation groups were also included in the dialogue process. All expressed support and desire to continue their involvement in the process and commended the CCFM for their forward thinking. Feedback from the public dialogue process will be used to direct the development of the Forest 2020 Guiding Principles.

Additional information on Forest 2020 is available at the following web-site www.ccfm.org/forest2020.

Criteria and indicators for sustainable forest management – To maintain Canada’s reputation as a world leader in sustainable development, it must be able to empirically demonstrate to the national and international natural resources community that it practices sound sustainable natural resources development. Towards this end, the Department, in collaboration with key partners, is developing a framework of criteria and indicators (C&I) of sustainable resource development as a science-based means of measuring, monitoring and reporting its progress towards sustainable development.

For instance, in collaboration with the Canadian Council of Forest Ministers (CCFM), NRCAN has made considerable progress on its C&I framework. This initiative has been actively pursued since the 1992 Earth Summit in Rio de Janeiro and forms a major component in Canada’s National Forest Strategy. The Department also supports, in collaboration with 12 other boreal and temperate forest countries, the development of an international C&I equivalent known as “The Montréal Process” aimed at pursuing the sustainability of the world’s temperate and boreal forests. To date, major national and

international milestones have included the release of:

- Canada’s national C&I framework entitled *Defining Sustainable Forest Management: A Canadian Approach to Criteria and Indicators*; the framework consists of 6 criteria and 83 indicators and identifies the wide array of forest values (criteria) that Canadians want to sustain and enhance; it also describes the factors (indicators) used to measure the condition of the values;
- the international C&I framework entitled *Sustainable Development of Boreal and Temperate Forests* which defines a set of 7 criteria and 67 indicators;
- a technical report and a summary report entitled *Criteria and Indicators of Sustainable Forest Management in Canada*, which describes Canada’s capacity to report on its indicators;
- Canada’s first report on a core set of its national indicators entitled *Criteria and Indicators of Sustainable Forest Management: National Status 2000*; and
- a technical paper entitled *Scaling National Criteria and Indicators to the Local Level* prepared by the Montréal Process Working Group on Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests; this assists member countries on how to link and aggregate environmental, economic and social data at national and local levels.

Another important milestone was the development, application and refinement of local level indicators of sustainable forest

management through Canada's network of 11 model forests located across Canada (see page 8 of this report for more details).

Future CCFM and departmental efforts will focus on maintaining and expanding current databases, developing methodologies to collect data for such areas as the social elements of sustainability, improving Canada's capacity to monitor sustainability, and enhancing Canadians' understanding of forest

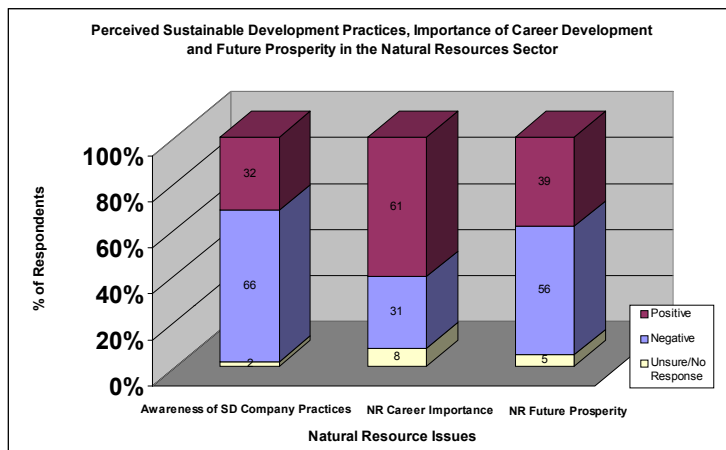
ecosystems, and establishing target levels for indicators. A CCFM task force, co-led by the Department, is presently undertaking a review of the C&I framework to ensure it continues to reflect the evolving values and knowledge Canadians have of their forests. The evaluation is expected to be completed in early 2003. More information on the CCFM's C&I initiative and the Montréal Process is available at <http://www.nrcan.gc.ca/ccfm/> and <http://mpci.org/>.

Communicating our knowledge well....

Objective: Creating easily accessible and integrated knowledge on the state of Canada's landmass and natural resources, and the economic, environmental, and social dimensions of their use.

Performance indicator: Public awareness of the importance and relevance of the natural resources sector, its issues, and NRCan's S&T.

Target: maintain or improve awareness.



Source: *Rethinking Government 2000*, Ekos Research Associates

NRCan's Contribution

- NRCan has been working diligently in creating an awareness among the public of the importance of the natural resources sector to Canada.
- The Minister of NRCan has developed a sustainable development vision for the natural resources sector in which S&T and innovation form a central core.
- In 2000-01, NRCan consulted with over 2000 Canadians on the sustainable development of our natural resources and raised awareness on corporate social responsibility in the natural resources sector through supplements in MacLean's magazine.
- NRCan has been working at the program level through, for example, the Biodiversity Resource Stewardship Initiative, the Energy Innovators Program, and the First Nation Forestry Program, to address the sustainable development practices of companies and career possibilities.

What Does the Graph Mean?

- The first bar in the graph indicates Canadians' perception of the sustainable development practices of companies in the natural resources sector. 32% of respondents indicated that they believe Canada's natural resources companies practice sustainable development.
- The second bar indicates Canadians' perceptions about a career in the natural resources sector. 61% indicated that a career in the natural resources sector would be an excellent choice.
- The third bar indicates Canadians' perceptions of the role of the natural resources sector in Canada's future prosperity. 39% feel that the natural resources industry will be a primary source of future prosperity for Canada.

Next Steps

- Canadians are very favorable to the federal government playing a role that carries out scientific research so that wise resource development and use is encouraged. Further examination of this role and its evolution in the future is important.
- Further reporting and monitoring of public awareness on various S&T and natural resource issues will also be done.

Using our influence to promote sustainability in the mining sector....

Objective: Greater national and international cooperation and consensus on sustainable development issues, policies, goals and actions.

Performance indicator: Participation in, and influence on, national and international multi-stakeholder approaches to sustainable development issues.

Target: Maintain or improve participation and influence.

<p style="text-align: center;">MEND / MEND 2000 WORKSHOP DELEGATES</p> <table border="1"> <caption>MEND / MEND 2000 Workshop Delegates</caption> <thead> <tr> <th>Year</th> <th>Cumulative Delegates</th> </tr> </thead> <tbody> <tr> <td>1994</td> <td>100</td> </tr> <tr> <td>1995</td> <td>300</td> </tr> <tr> <td>1996</td> <td>900</td> </tr> <tr> <td>1997</td> <td>1700</td> </tr> <tr> <td>1998</td> <td>1950</td> </tr> <tr> <td>1999</td> <td>2350</td> </tr> <tr> <td>2000</td> <td>2600</td> </tr> </tbody> </table> <p>Mine Environment Neutral Drainage (MEND) Program</p>	Year	Cumulative Delegates	1994	100	1995	300	1996	900	1997	1700	1998	1950	1999	2350	2000	2600	<p><u>NRCan's Contribution</u></p> <ul style="list-style-type: none"> • The Mine Environment Neutral Drainage (MEND) Program was the first international multi-stakeholder initiative to develop scientifically-based technologies to reduce the effect of acidic drainage. • The original MEND Program extended over a nine-year time frame ending in 1997, with technology transfer activities continuing to the end of 2000 under the MEND 2000 program. • MEND and MEND 2000 demonstrated the benefits of cooperation between government, non-governmental organizations and industry to develop new technologies. • MEND has established Canada as the global leader in research and development on acidic mine drainage. • An evaluation of MEND concluded that the liability of five mine sites alone had been reduced by \$340 million.
Year	Cumulative Delegates																
1994	100																
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1997	1700																
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<p><u>What Does the Graph Mean?</u></p> <ul style="list-style-type: none"> • Acidic drainage has long been recognized as the largest environmental liability facing Canada's mining industry, and to a lesser extent, the public through abandoned mines. • Acidic drainage is the result of a natural oxidation process whereby sulfur-bearing minerals oxidize upon exposure to oxygen and water. The net result is the generation of metal-laden effluents of low pH that can potentially cause damage to ecosystems in the downstream environment. • The dissemination of information to MEND's partners, clients and the public is a major function of the program. • MEND hosts several workshops per year on key topics at various locations across Canada. These workshops provide an excellent opportunity to transfer information to clients. As indicated by the graph, the workshops attracted over 2500 delegates by 2000. 	<p><u>Next Steps</u></p> <ul style="list-style-type: none"> • Although the MEND 2000 program ended in December 2000, members of the MEND 2000 Steering Committee recommended that a renewed national acidic drainage research program, referred to as MEND3, be launched in 2001. • MEND3's primary objective will be to provide leadership to research on acidic drainage both within Canada and abroad. 																



Strategic Outcome #2 - To provide Canadians with sustainable economic, social and environmental benefits derived from natural resources for present and future generations.

Expenditures 2000-01: \$180.1M

Short to medium-term objectives	Performance Indicators	Departmental Priorities for 2000-01	Speech from the Throne Themes
<p>Greater economic opportunities and encouraging investment in innovative and higher value uses of natural resources.</p> <p>Expanded access to international markets for Canadian resource-based products, knowledge, technologies and services.</p> <p>Increased capacity of Aboriginal, rural and northern communities to generate sustainable economic activity based on natural resources.</p>	<p>Economic influence of NRCan S&T.</p> <p>Employment levels and productivity in resource and resource-related industries.</p> <p>Contribution of the natural resources sector to the GDP.*</p> <p>Capital investment in resource and resource-related industries.</p> <p>Value and percent of exports of resource-based products.</p> <p>Number of shared projects and funds leveraged with rural, Aboriginal and northern communities.*</p> <p>Employment level of Aboriginal people and northern residents in resource sectors.</p>	<p>Resource Innovation</p> <ul style="list-style-type: none"> • Support innovation and development of new technologies in leading export sectors such as natural resources. • Support greater economic stability and diversification in rural communities and regions through the development and adoption of new technologies. <p>Resource Trade and Investment</p> <ul style="list-style-type: none"> • Maintain and expand access to international markets. • Contribute to government priorities through trade promotion and international business development. • Undertake ministerial and other missions to support Canadian natural resource industries on market access issues and to foster exports of value-added services and technologies in the natural resources sector. • Promote Canada as an attractive destination for investment from both domestic and foreign sources. <p>Regional Approach</p> <ul style="list-style-type: none"> • Develop increased regional focus to strengthen partnerships across all regions and enhance economic opportunity related to natural resources. <p>Work Opportunities</p> <ul style="list-style-type: none"> • Enhance development of skills of Canadians, including Aboriginal peoples, related to natural resources and land development, use and management, which would increase their economic opportunities. 	<p>Creating Opportunity</p> <ul style="list-style-type: none"> • Innovation • Skills and learning • Trade and investment <p>Sharing Opportunity</p> <ul style="list-style-type: none"> • Strong and safe communities <p>Creating and Sharing Opportunities Globally</p> <ul style="list-style-type: none"> • Stronger international institutions

What we have accomplished.....

Stimulating new investment in mineral exploration: Canada's Targeted Geoscience Initiative – Understanding the geological framework and environmental conditions is of critical importance if Canada is to sustain and make sound decisions about its natural resources. The first line of knowledge for this understanding comes from basic science and technology tools such as geological maps, mineral and hydrocarbon deposit studies and remote sensing. The transfer of this knowledge and new technologies stimulates innovation and fosters growth.

The 2000-01 federal budget announced the allocation of \$15 million over three-years for the new Targeted Geoscience Initiative (TGI) to ensure that Canada's geological information infrastructure continues to be state-of-the-art to stimulate new investment in mineral and energy resources exploration. This initiative supports the creation of new geological data and information, and related geological maps regarding under explored areas with high potential for mineral deposits. This new information will be readily accessible through the Internet.

In collaboration with provincial and territorial geological surveys and Canada's mineral exploration industry, 22 new field-based geoscience projects were identified from the needs and priorities of the participating jurisdictions, and field activities commenced immediately. TGI projects were initiated in nine provinces and three territories. An early indication of the anticipated success of the TGI was the augmentation to the initiatives' funding base from \$4 million to almost

\$11 million in 2000-01. The \$7 million increase is from NRCan (\$2 million) and the provincial-territorial and industrial partners (\$5 million).

While the full impact of the new knowledge gained from TGI may not be appreciated for a number of years, TGI stakeholders have accepted, with enthusiasm, the preliminary results released from several of the studies. The private sector has incorporated these in their planning for summer 2001 exploration work.

In a number of instances, the preliminary results have led to changes in the geological maps of the study regions in question, with as yet unknown implications for mineral potential in Canada. In other cases, however, the impacts could be more immediate. In Quebec, for example, the discovery of particular rock types within a sequence of sediments represents a newly recognized geological context favourable for base metal deposits, as demonstrated elsewhere in the world. Studies in Cape Breton Island give strong indications that additional near-surface gypsum deposits are likely which could extend the life of the area's industrial minerals operations.

A new gold occurrence was brought to light by geochemical analyses of stream sediments in New Brunswick. New sites with high potential for precious metals were discovered from studies of glacial deposits in the Ungava Peninsula, and results from similar studies are expanding the potential region for diamonds in northern Ontario. Seismic and borehole geophysics investigations in the Athabasca Basin of Saskatchewan and Alberta have provided new information to correlate uranium-bearing rocks across the basin to reduce

exploration risks. Geochemistry of surface deposits in the Yukon-Tanana terrane identified several metal anomalies for which follow up exploration seems warranted. Recognition in central Baffin Island of a rock unit similar to those that host the important nickel deposits of the Thompson mining district in Manitoba, will lead to exploration activity in this part of Nunavut in 2001.

Through S&T initiatives such as the TGI, the government is making an important investment in providing sound scientific information in natural resources, contributing to Canada's present and future economic resources. Additional TGI projects will be undertaken with stakeholders over the next two years.

Did you know?

NRCan has helped thousands of northern research scientists (from government, northern communities, universities and from abroad) by providing cost-effective logistics support to programs in Canada's High Arctic. Details about NRCan's Polar Continental Shelf Program can be found at <http://polar.nrcan.gc.ca>

North American energy market opportunities – Brought on by higher energy prices, rolling electricity black-outs in California and a perceived energy crisis by the new Bush administration, North American energy issues have become more prominent. U.S. Vice-President Cheney chaired a national energy policy development group that released its report in May 2001. Among its many recommendations, the report recognizes that Canada is the leading foreign supplier of natural gas, oil and electricity to the U.S. and that our sustainable development-based energy strategies contribute to the health of the North

American Free Trade Agreement (NAFTA) economy and our shared environment.

Energy developments in the U.S. present significant opportunities for Canada's energy sector, including oil and natural gas production off Canada's east coast, natural gas potential in Canada's north and Alaska, uranium resources in northern Saskatchewan and increasing interconnection of our electricity grids, with the potential to add flexibility and resiliency to create economies and to facilitate new sources of supply.

Our commitment to sustainable development requires that, while we pursue these opportunities, we also take into account environmental responsibility at both the regional and global levels. Consequently, attention to market opportunities for expanded energy trade must be balanced with continued strong emphasis on promoting the clean and efficient production and use of energy. In addition, we must look at social implications for local communities, including Aboriginal peoples. Their interests and engagement must be ensured in any new energy developments that affect them. In Canada's north, in particular, there is interest in participating in new energy development, but also a strong concern to protect cultures and ways of life, and the resources and environment on which they depend.

Canada, the United States, and Mexico have begun to discuss ways to increase openness and regulatory transparency, and to improve the overall functioning of the North American energy market. To work towards these goals, NRCan and the Mexican Department of Energy have reinvigorated their bilateral discussions. NRCan, the United States Department of Energy

(DOE) and the Mexican Department of Energy are also establishing a North American Energy Working Group. Along with the existing Energy Consultative Mechanism with the U.S., these endeavours will help to exchange views and share information on factors affecting North American energy (including policies, programs and market developments) and to identify issues where cooperative work can be helpful (such as regulatory structures, interconnections, technical specifications and technology R&D). The scope of discussions will include the full range of energy development, production, transport, transmission, distribution and consumption in North America. It will also consider all energy sources, as well as the efficient production and use of energy. An example of such ongoing collaboration is a joint Canada-U.S.-Mexico study on future transportation fuel options for North America to 2050 to help assess the energy, environmental and policy implications of the various technologies and fuels that could be employed, as well as to identify the R&D gaps that need to be addressed jointly.

NRCan is also actively engaged in research and technology cooperation with other countries through the International Energy Agency (IEA) and bilateral agreements. For example, NRCan's Memorandum of Understanding (MOU) on Energy R&D with the U.S. DOE enhances Canadian research and technology capabilities through access to and partnerships with DOE programs and laboratories. Under this MOU, implementing arrangements on fossil fuels, fuel cells and bioenergy have been signed and another on microgeneration is under discussion. Moreover, the Department has worked actively with the IEA to develop a set of longer perspectives on the energy technology needs of the key energy-using and producing

sectors in member countries, leading to the identification of energy R&D needs and enhanced international collaboration.

Did you know?

Canada's oil sands, a readily accessible source of over 300 billion barrels of recoverable oil, are a huge unique resource exceeding the Saudi Arabian oil reserves. They are Canada's largest natural resource development and export opportunity in the next decade. By virtue of their uniqueness, the challenges faced by industry and government in developing the oil sands require made-in-Canada solutions. NRCan, in partnership with other government agencies and industry, is developing and promoting technologies to enhance the production of oil from the sands by reducing the capital and operating costs as well as the environmental impacts. Economically, this has also led to \$51 billion in new capital expenditure announcements by the private sector. Innovative technologies on consolidated tailings and froth treatment have successfully seen the industry through the stages of planning and regulatory approval, and are being employed by existing as well as new entrants emerging in the industry. In addition, NRCan continues to work with the oil sands industry to develop an industry road map outlining the key technology developments and applications that will ensure that we continue to add value from this industry, encourage its economic expansion and reduce the environmental footprint from oil sands production.

The natural resources sector, a significant contributor to the GDP – The natural resource industries make a significant contribution to Canada's Gross Domestic Product (GDP). The sector also provides hundreds of thousands of high paying jobs and their operations are the livelihood of many rural and remote communities across Canada. Information on the contribution of the natural resources sector to the GDP is presented in a quadrant format on page 25.

Global business opportunities –

Canadian trade missions outside Canada are essential to foster the growth of trust, as well as an understanding about our programs and policies, and to explore and enhance business opportunities. Trade missions help not only to close deals, but also to get a feel for local needs and opportunities. They offer firms the opportunity to meet potential business contacts and decision-makers whom they would normally have difficulty meeting on their own.

Asian Trade Mission, January 2000

The Minister of NRCan – accompanied by some 70 resource-based companies, three provincial ministers, Aboriginal and municipal leaders – led a successful trade mission to China, South Korea and Japan.

The mission has continued to yield benefits. Follow-up events in Canada and China have included training programs (for example, on pest control, fire management, mining regulations), workshops, conferences, seminars, and exhibitions/presentations (for example, Renewable Energy Exposition in Beijing, geospatial data management and remote sensing applications). In addition, a Memorandum of Understanding, signed between NRCan and the Chinese State Development Commission, creates an umbrella for bilateral energy cooperation between Canada and China. This expanded cooperation with China is providing increasing evidence of Canada's capabilities. As a result of several visits of Chinese officials to Canada, it is anticipated that sales of fertilizers and building products will expand. The mission also laid the groundwork for the successful massive participation of natural resource companies in the Prime Minister's Team Canada mission to China in February 2001.

European Mission, September 2000

The Minister led a departmental delegation to Brussels and Berlin, in September 2000, to meet with decision-makers in the European Commission, the German government and Canadian and European business community. Europe is Canada's second largest export market and a third of our exports to Europe are natural resource based. Maintaining and expanding access is critical to Canada's trade and investment performance and will become even more important as the European Union enlargement comes into force.

The visit was important to signal to the European Union the value the Government of Canada places on the bilateral relationship and to demonstrate Canada's priorities. It opened better channels of communication and information exchange, and laid the groundwork for more timely Canadian engagement in various European Union legislative and regulatory processes.

Promoting business growth through good community infrastructure –

NRCan recognizes the challenges faced by northern communities in building a productive and knowledgeable culture. The scarcity of educational resources and the high cost of delivering programs to a widely dispersed population is an issue. Partnerships are required to provide training and development programs to Aboriginal and community administrators to enable them to fulfil their responsibilities under self-government.

NRCan partnered with the School of Community Government, the Government of the N.W.T. and Aurora College in a two-year Community Land Administration Certificate Program for which it invested \$300K. The program, which has been delivered to over 50 community land management officers in the

past two years, has sparked interest in other northern areas and is being expanded to include participants from the Government of Nunavut.

The Sustainable Communities Initiative (SCI) Program – a component of GeoConnections – is another collaborative effort to help communities make informed land management decisions through the use of Geographic Information Systems (GIS). It also creates an opportunity to enhance S&T awareness and to inspire Aboriginals to enter disciplines where they are presently under-represented.



Blood Tribe team

In 2000-01, NRCan worked with 34 communities across Canada, including 21 First Nations. Through the provision of tools, support, networks and advice, GIS were developed. Why is this important to communities? It strengthens their natural resource base and capacity to participate in new resource sector opportunities and initiatives and enable sound social decisions. The following examples illustrate a few key results from these collaborative initiatives.

Blood Tribe

To address a priority concern over the lack of emergency response programs and limited knowledge about the overall geography of the Blood Tribe reserve, an emergency response program using GIS and global positioning systems (GPS) to cover the entire reserve was designed. This will assist fire, ambulance, and police departments with accurate emergency routes and distance times; allow the link up to the 9-1-1 Emergency Services in Southern Alberta; and explore partnerships with three major utility companies to share data.

Blood Tribe at a Glance

- over 500 square miles of land;
- one of the largest reserves in Canada;
- made up of 26 separate entities;
- population of 9,000 people; and
- Chief and Council oversee land management decisions with input from various departments.

Recognizing the need for educated and trained people in various disciplines, the Blood Tribe has taken an approach to recruit young people with technical and scientific education which will help strengthen and expand economic opportunities. For example, one of the project's management trainees – who had recently received a degree in environmental science and had been trained in GIS, surveying, and various data systems – worked on developing the emergency response program.

The Blood Tribe is also using GIS to identify agricultural and other land uses, mineral mining, and oil and gas exploration to plan for future land management decisions. This is allowing them to work with other organizations, such as the agriculture research station in Lethbridge, to resolve problems affecting their resources and to make informed social and human decisions.

For example, over 100 archeological sites, such as burial sites, medicine wheels and other historical or sacred areas have been mapped and information about a potential oil site was identified. Based on this information, the Chief and Council made a motion that no development could be made close to medicine wheel and burial sites. This is what geospatial information is all about, sound decision-making.

Eel Ground First Nation

The Eel Ground First Nation Sustainable Communities Initiative is another partnership example where developing the mechanisms to properly manage their resources is essential in strengthening and building their capacity in forest management. Eel Ground is surrounded by a very active forestry industry.

Now that the Eel Ground has acquired a GPS, information collected can be enhanced. The use of GPS and GIS provides this First Nation with the ability for long-term forest lands projections. To meet their needs, NRCan provided additional training for their computer specialist. Eel Ground is one of six members of the North Shore MicMac District Tribal Council. It believes in information-sharing and sees this as a way for other First Nations to organize their resources and become stronger people.

With respect to land management, NRCan allocated \$200K last year to community college training for First Nations students with interest in legal surveying, technical and support services associated with land management. As the First Nations are increasingly assuming authorities under self-government, it is important to encourage participation in these courses.

Promotion of investment in mineral exploration

– The federal income tax regime is a key element influencing the health of Canada’s minerals and metals industries. NRCan plays an active role in ensuring that key provisions of Canada’s tax regime meet the demands of international competitiveness and the long-term sustainability of the minerals and metals industries.

A 15 percent investment tax credit for mineral exploration was announced in the Economic Statement and Budget Update of October 18, 2000. The tax credit allows investors to deduct 15 percent from federal tax payable on top of the deduction of 100 percent of eligible exploration expenses from taxable income.

NRCan provided advice and analysis to Finance Canada and industry on the design of a tax incentive that would be most effective in delivering the maximum benefits while providing simplicity for the users. The resulting investment tax credit is narrowly focussed on surface “grass-roots” exploration, which is where the new discoveries are made that ensure the long-term sustainability and international competitiveness of the mining industry. The design of the tax credit is also aimed at providing a mechanism that could be easily harmonized with provincial tax incentives.

The introduction of the tax credit was the culmination of efforts by industry, notably the Prospectors and Developers Association of Canada, leaders of northern communities and parliamentarians. The tax credit has the potential to revitalize Canada’s mining industry, and northern and rural communities. More information on the tax credit and its advantages can be found at <http://www.nrcan.gc.ca/miningtax>.

Advanced technology in the mining industry – In March 2001, the five-year \$27 million Mining Automation Program (MAP) was completed. MAP's participants included NRCan (through its laboratories in Ottawa, Sudbury and Val d'Or), Inco Limited (one of the world's leading producers of nickel), Sandvik Tamrock (a manufacturer of mining vehicles), and Dyno Nobel (a producer of explosives). NRCan contributed \$1.8 million to the program.



Control room for operating remote mining equipment (photo courtesy of INCO - Mining Automation Program).

The program's objective was to improve productivity and the health and safety of mine workers by removing personnel from exposure to accidents or emissions, developing automated controls that reduce the risks and consequences of accidents, and implementing a system that better monitors and reduces risks and allows a more rapid response to incidents. Canadian mining operations are increasingly under pressure to compete with low-cost foreign producers. Furthermore, Canadian operations must extract ore at greater depths, which increases costs and poses greater risk to the safety of mine workers.

MAP developed a safer approach to underground mining, demonstrated Canadian leadership in the development and application of new technology in the mining sector, and showed the value of public-private sector partnerships. NRCan's primary responsibility was to facilitate the review and actions on safety and regulatory issues. The Department's largest single effort was the Innovative Telemining Methods project which assessed ground stresses for novel mining methods using telemining equipment. As well, NRCan assisted with some of the key MAP trials, led other projects such as the development of ventilation concepts for remotely-controlled equipment, and performed tests and reviews of vision systems.

Equipment developed under MAP includes a remotely operated vehicle for transporting and operating drills and a remotely operated explosives system. Communications, positioning and control systems were also developed. The MAP technologies clearly improve the health and safety of mine workers, and enhance the productivity and reduce the costs of Canadian mining companies. A lengthy article on MAP was published in a recent issue of *Canadian Business* (August 20, 2001).

Sustaining Canada's Aboriginal communities – With some 80 percent of First Nation communities located in Canada's forested landscape, on and off-reserve forests continue to offer a strong foundation for self-sufficiency through innovative economic development opportunities and initiatives. The forests also provide a foundation upon which First Nations can build technical capacity, develop on and off-reserve partnerships, maintain their spiritual, recreational and cultural connection to the land, and carry on traditional uses of the land base.

Canada's First Nation Forestry Program (FNFP) (1996-2001) is designed to enhance the capacity of First Nations to operate and participate in forest-based businesses and increase the number of long-term and sustainable job opportunities in the forestry sector; increase First Nation cooperation and partnerships; investigate and implement innovative funding mechanisms; and enhance the capacity of First Nations to manage reserve forests sustainably.



First Nations and government – partnerships in action.

One empirical measure used in assessing the FNFP's performance relates to its ability in leveraging funds and in creating partnerships. The quadrant on the following page presents the total five-year FNFP contributions from all sources, includes some of the program's major benefits, and sets the stage for key upcoming activities.

Over the course of the FNFP, many community-based success stories have been chronicled in the annual FNFP report and in the Department's recent publication entitled *First Nation Forestry Program: Five Years in Review*. A profile of these success stories can be found at the following web site: <http://www.fnfp.gc.ca>.

The impact of the FNFP can still be best summed-up by the observation made in the Interim Review of 1998 which states that the "FNFP is more than just a program, it is a concept and a process that ushers in a new relationship between First Nations, governments and the private sector".

Sustaining Canada's Aboriginal communities....

Objective: Increased capacity of Aboriginal, rural and northern communities to generate sustainable economic activity based on natural resources.

Performance indicator: Number of shared projects and funds leveraged with rural, Aboriginal and northern communities.

Target: Trend analysis and monitoring.

<table border="1"> <caption>First Nation Forestry Program (FNFP) Expenditure (\$ millions)</caption> <thead> <tr> <th>Year</th> <th>FNFP</th> <th>First Nations</th> <th>Other Sources</th> </tr> </thead> <tbody> <tr> <td>1996/97</td> <td>6.0</td> <td>4.3</td> <td>2.0</td> </tr> <tr> <td>1997/98</td> <td>5.5</td> <td>6.7</td> <td>5.4</td> </tr> <tr> <td>1998/99</td> <td>5.1</td> <td>3.8</td> <td>6.1</td> </tr> <tr> <td>1999/00</td> <td>4.9</td> <td>6.7</td> <td>4.8</td> </tr> <tr> <td>2000/01</td> <td>4.0</td> <td>6.7</td> <td>3.8</td> </tr> </tbody> </table>	Year	FNFP	First Nations	Other Sources	1996/97	6.0	4.3	2.0	1997/98	5.5	6.7	5.4	1998/99	5.1	3.8	6.1	1999/00	4.9	6.7	4.8	2000/01	4.0	6.7	3.8	<p><u>NRCan's Contribution</u></p> <ul style="list-style-type: none"> • NRCan works closely with First Nation project applicants and encourages them to seek out partners to support projects. • NRCan informs non-Aboriginal forestry companies and provincial government agencies of the FNFP and the potential opportunities to partner with First Nations. • NRCan provides the infrastructure and coordination for the implementation of the program, including the coordination of the national, provincial and territorial management committees that bring program partners together. • The FNFP supported 966 projects and successfully provided 3,900 First Nation workers with job experience, created over 55,000 person-weeks of employment and received 1,480 project proposals valued at \$152.5 million. • Examples of project accomplishments over the past five years include training and technology transfer in specialized areas such as home log building, nursery development, wildfire certification courses, silviculture and business planning. Other accomplishments included the creation of First Nation and non-Aboriginal partnerships in forestry activities and processing.
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2000/01	4.0	6.7	3.8																						
<p><u>What Does the Graph Mean?</u></p> <ul style="list-style-type: none"> • Canada's FNFP is a vehicle for improving economic conditions in First Nation communities based upon sustainable forest management. • Federal funding has been used by First Nation project applicants to lever additional project funds from First Nation communities and other non-Aboriginal partners annually since 1996-97. • Over the first five years of the program, federal contribution funding of \$21.1 million resulted in an additional \$49.0 million being levered from First Nation and other sources to bring total program value to \$70.1 million. 	<p><u>Next Steps</u></p> <ul style="list-style-type: none"> • NRCan and its partner, Indian and Northern Affairs (INAC), will continue to provide technical and other assistance to First Nations in the development of forestry related economic opportunities. • NRCan will continue to assist First Nations to acquire non-Aboriginal partner funds. • NRCan will continue to market the benefits and importance of partnerships to government and non-Aboriginal forestry companies to ensure First Nation forestry needs are met. • NRCan will demonstrate that the FNFP is meeting objectives. • NRCan will continue to chronicle community-based success stories in the FNFP annual report and in departmental publications such as the <i>First Nation Forestry Program, Five Years in Review (1996/97-2000/01)</i>. • NRCan, in collaboration with INAC will seek the renewal of the FNFP in 2001-02. 																								

The natural resources sector, a significant contributor to the GDP....

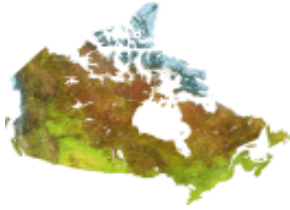
Objective: Greater economic opportunities and encouraging investment in innovative and higher-value uses of natural resources.

Performance indicator: Contribution of the natural resources sector to the Gross Domestic Product (GDP).

Target: Trend analysis and monitoring.

<p style="text-align: center;">Gross Domestic Product for the Natural Resource Industries 1996-2000 (Million \$, 1992 prices)</p> <table border="1"> <caption>Estimated GDP for Natural Resource Industries (Million \$, 1992 prices)</caption> <thead> <tr> <th>Year</th> <th>Minerals</th> <th>Forestry</th> <th>Energy</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>1996</td> <td>25,000</td> <td>15,000</td> <td>48,000</td> <td>88,000</td> </tr> <tr> <td>1997</td> <td>26,000</td> <td>16,000</td> <td>48,000</td> <td>90,000</td> </tr> <tr> <td>1998</td> <td>27,000</td> <td>17,000</td> <td>48,000</td> <td>92,000</td> </tr> <tr> <td>1999</td> <td>28,000</td> <td>18,000</td> <td>48,000</td> <td>94,000</td> </tr> <tr> <td>2000</td> <td>29,000</td> <td>19,000</td> <td>46,416</td> <td>94,416</td> </tr> </tbody> </table>	Year	Minerals	Forestry	Energy	Total	1996	25,000	15,000	48,000	88,000	1997	26,000	16,000	48,000	90,000	1998	27,000	17,000	48,000	92,000	1999	28,000	18,000	48,000	94,000	2000	29,000	19,000	46,416	94,416	<p><u>NRCan's Contribution</u></p> <ul style="list-style-type: none"> • NRCan is recognized internationally for the R&D it conducts in cooperation with leading research institutions making significant contributions to the strength of natural resource industries within the Canadian economy. • NRCan supports development of world-class energy technologies, promotes Canadian forest S&T throughout the world, and houses the world's leading knowledge base of Canada's minerals and metals industry. • NRCan develops resource-oriented technologies, and promotes the success of natural resource industries in the knowledge-based innovative economy. • NRCan explores and enhances international opportunities for Canadian companies, and leads international trade and investment missions to provide improved market access for Canadian natural resource products. • NRCan helps Canadian companies market products at home and internationally.
Year	Minerals	Forestry	Energy	Total																											
1996	25,000	15,000	48,000	88,000																											
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2000	29,000	19,000	46,416	94,416																											
<p><u>What Does the Graph Mean?</u></p> <ul style="list-style-type: none"> • This graph brings together statistical information on the GDP in 1992 prices to describe the importance of natural resource industries, including the energy, forestry, and minerals and metals industries, to the economy. • In 2000, the GDP of the natural resource industries was estimated at \$94,416 million, accounting for 12% of the GDP of the total economy. From 1996 to 2000, the GDP of the natural resource industries increased by 8.55%, averaging more than a 2% increase per year. For the economy as a whole, the GDP over this period increased by 16.96%, averaging more than a 4% increase per year. • In addition to being directly responsible for over 748 thousand jobs in Canada, these industries create many more indirect jobs in other industries that provide supplies and services. • Employment is the most important measure to many resource-dependent communities in Canada. Natural resource industries provide high paying jobs across Canada, particularly in rural and remote areas. 	<p><u>Next Steps</u></p> <ul style="list-style-type: none"> • Innovation and productivity growth are key to maintaining strong natural resource industries in Canada. NRCan will both perform and support R&D to improve our industrial competitiveness, and to provide S&T solutions for a healthy environment • To spur innovation in natural resource industries, NRCan will continue to strengthen its S&T programs. • NRCan will strive to build strong collaborative partnerships to develop the critical mass necessary to achieve research excellence and competitive advantage. • NRCan will continue to promote the vital economic contributions of natural resource industries to the economy. • NRCan will advance sustainable development by working with partners to develop technically-sound solutions to environmental problems. 																														

Note: Natural resource industries are defined to include energy, forestry and mining, and downstream industries, including the pulp and paper and paperboard mills industries, the metal fabricating industries and the refined petroleum and coal product industries. It is difficult to discern and measure the impact of NRCan's contributions on the GDP of natural resource industries.



Strategic Outcome #3 - To provide Canadians with strategies that reduce the environmental impacts in the natural resources sector.

Expenditures 2000-01: \$174.4M

Short to medium-term objectives	Performance Indicators	Departmental Priorities for 2000-01	Speech from the Throne Themes
<p>Canada addressing its international Kyoto commitment to reduce greenhouse gas emissions.</p> <p>Scientific research, technologies and stewardship practices that reduce environmental impacts, conserve biodiversity, and increase the efficiency of resource development and use.</p> <p>Canada's environment safeguarded from the risks associated with natural resource development and use.</p>	<p>GHG emissions compared to Kyoto protocol; and GHG emissions to GDP ratio compared to other countries.</p> <p>Trends in use of renewable energy.</p> <p>Trends in energy efficiency.</p> <p>GHG emissions from federal operations.</p> <p>Progress towards the identification of impacts and adaptation measures.*</p> <p>Environmental influence of NRCan's science, technology and stewardship practices.*</p> <p>Progress towards addressing hazards associated with resource development and use.</p>	<p>Climate Change</p> <ul style="list-style-type: none"> • Lead in key aspects of climate change policy development, program development and delivery of S&T. • Co-manage the federal process to develop the Climate Change National Implementation Strategy. • Work with other climate change stakeholders in the development of appropriate federal perspectives and actions. • For those elements where NRCan has lead responsibility, develop a package of complementary measures for reducing emissions and enhancing carbon sinks; and a path forward to develop a climate change adaptation strategy. <p>Environment</p> <ul style="list-style-type: none"> • Support research and development of sustainable development technologies and practices. • Provide policy advice based on the principles of sustainable development. 	<p>Creating Opportunity</p> <ul style="list-style-type: none"> • Innovation • Trade and investment <p>Sharing Opportunity</p> <ul style="list-style-type: none"> • Clean environment

* Performance information on these specific indicators is presented in a quadrant format on pages 34 and 35.

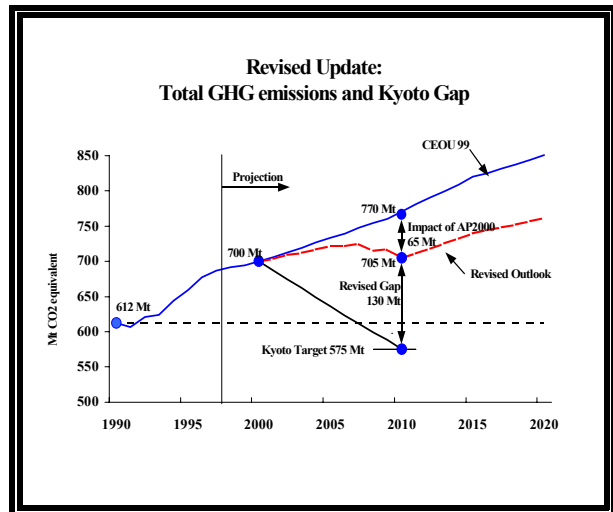
What we have accomplished.....

Addressing the climate change

challenge – The past year has witnessed the advent of a wealth of initiatives in Canada designed to address global climate change. Though climate change presents one of the greatest global challenges for an innovative economy and a healthy environment, it also presents many opportunities.

NRCan was a key player in the 1998 consultations on climate change, which included 450 experts from industry, academia, non-government organizations, municipalities, federal, provincial and territorial governments. In October of last year, the federal, provincial and territorial ministers of energy and environment released a National Implementation Strategy (NIS) and a first national business plan under the NIS, providing the framework for a coordinated Canadian response to climate change. The Government of Canada further released *Action Plan 2000 on Climate Change* on October 6, 2000. This action plan provides \$500 million over five years for various measures in key sectors such as energy (oil and gas production and electricity), transportation, industry, buildings, forestry and agriculture that account for more than 90 percent of Canada's greenhouse gas (GHG) emissions. Once fully implemented, these measures are expected to reduce Canada's GHG emissions by an estimated 65 megatonnes per year during the period 2008-12, taking Canada one third of the way to achieving its target of six percent below 1990 levels – a target established in the Kyoto Protocol in 1997 where industrialized countries agreed to reduce their combined GHG emissions by at least five percent compared to 1990 levels by the period 2008-12.

(<http://www.climatechange.gc.ca>)



Source: NRCan (based on Environment Canada's 1998 GHG inventory)

The federal contribution to the national business plan is in addition to previous federal investments outlined in the February 2000 budget, in which \$625 million over five years were committed toward increased action to address climate change. Budget 2000 included an extension to the Climate Change Action Fund (CCAF) of \$150 million over three years bringing it to 2003-04 to sustain and galvanize the domestic momentum for taking action on climate change developed since Kyoto.

Did you know?

An audit of governance and accountability found that the CCAF is well managed with an effective strategic leadership structure and is effectively managing its partner relationships to ensure sustained interest and delivery of its mandate with partner participation in committees, in co-funding and as recipients.

Municipalities are key players in efforts to reduce GHG emissions and have been particularly active in developing local action plans focused on improved energy efficiency, the use of renewable energy, landfill gas recovery, and more efficient waste

management and land use. Recognizing the municipalities' leadership role and the role of the Federation of Canadian Municipalities, Budget 2000 provided, through NRCan and Environment Canada, \$125 million for the creation of two funds. The Green Municipal Enabling Fund and the Green Municipal Investment Fund encourage investment in green municipal infrastructure while leveraging municipal, provincial-territorial and private sector investments. In addition, \$15 million was pledged to expand procurement of "Green Power" into Saskatchewan (\$12.4 million over ten years) and Prince Edward Island (P.E.I.). Performance indicators for activities, outputs, reach and outcomes to assist management in monitoring and reporting on performance were developed as part of results-based management and accountability frameworks for this \$15 million federal investment.

Did you know?

- Eight windmills constructed at North Cape, P.E.I. will generate some 16.6 million kWh per year of electrical power, and reduce GHG emissions by about 13,000 tonnes per year.
- With research and development assistance from NRCan and Environment Canada, the City of London used a model to develop a solid waste management system that resulted in a decrease of carbon dioxide (CO₂) emissions of about 30,000 tonnes over a four-year period (1995-99). Other municipalities will be using the same model to reduce their own CO₂ emissions from landfill sites.

Budget 2000 also announced the establishment of a Sustainable Development Technology Fund at an initial level of \$100 million to stimulate the development and demonstration of new Canadian environmental technologies, particularly those aimed at climate change and air quality. In 2001, NRCan introduced a Bill to Parliament to create the *Canada Foundation for Sustainable Development Technology Act*, a legislated foundation to administer the fund. On the international front, NRCan has been and

continues to be an active participant in negotiations aimed at developing sound, flexible and cost effective international rules for implementing the Kyoto Protocol. Canada's objectives include the pursuit of market-based Kyoto mechanisms, the comprehensive inclusion of carbon sinks, ensuring a level playing field for Canada to compete, maximizing participation of key developed and developing countries, and ensuring a compliance regime that helps countries meet their obligations. Despite significant efforts, an agreement could not be reached at the ministerial level in The Hague in November 2000, but Canada is continuing to work internationally in pursuit of global solutions to this global problem. The political agreement recently reached in Bonn, Germany, represents an important step forward and sets the stage for the creation of an international framework for actions.

Clean coal - who would have thought... NRCan is developing technology to clean up the combustion of coal by burning it in oxygen in place of air, leading to a significant reduction in emissions and easier clean up. The ultimate objective is the complete capture of all gaseous emissions from coal combustion, creating a clean coal plant. In 2000-01, NRCan demonstrated the successful operation of this technology at pilot scale with the capture of hazardous combustion products to produce an emission stream of pure CO₂ that can be captured for industrial use or for sequestration. NRCan is also developing and promoting technologies to reduce the amount of CO₂ emissions from coal mine ventilation. Using our technology to treat half of the emissions from the underground mines of the world's large coal producers would reduce global CO₂-equivalent emissions by 125 megatonnes annually and generate revenues of \$US 1.5 billion. The technology represents a significant new export product for Canadian manufacturing and engineering firms and has generated substantial international interest.

Energy efficiency makes environmental Sense

In government – The Government of Canada, the largest single enterprise across the country, recognizes its major role in becoming an example to other Canadian institutions. Initiatives implemented by the federal government assisted in reducing GHG emissions and resulted in annual energy cost savings. At NRCan, we invested \$7.6 million in the national retrofit of our custodial sites, which led to annual energy savings of about \$1 million per year since 1998. Fourteen Canadian Forces bases have awarded energy performance contracts with an investment of \$90 million in energy efficiency improvements that are expected to produce energy savings of more than \$10 million per year. In 1998, Environment Canada and Public Works and Government Services Canada launched the first Federal Buildings Initiative energy improvement project in facilities leased by the federal government. As a result, the Place Vincent Massey complex located in Hull, Quebec, entered into a \$1.8 million energy performance contract that is expected to generate some \$200K in annual energy cost savings.

In industry – NRCan continued to promote the adoption by industry of energy saving technologies and processes. The continued and growing success of the Industrial Energy Research and Development program was responsible for the reduction of 52 kilotonnes of CO₂ on the part of Canadian industry last year. Process integration, a knowledge-based technology to optimize the interconnections between different parts of an industrial plant so that energy and materials are used in an optimum way, is broadly applicable to a wide variety of industrial processes and has a large potential to reduce CO₂ emissions, energy consumption, pollutants and costs. Drying, one

of the most common and energy-intensive industrial processes, generates more than 19 megatonnes of CO₂ annually. In 2000-01, NRCan successfully demonstrated a pilot-scale pulse fluid bed dryer, which has an energy efficiency of 60 percent, operates at a significantly higher temperature than most existing technologies, and is ideally suited for drying hard-to-handle, oddly shaped and fragile materials. In only two years, NRCan's process integration methodologies have saved Canadian industry more than \$2 million in energy costs, and have reduced CO₂ emissions by more than 120,000 tonnes and liquid effluents by 4 million cubic metres.

In the residential sector - Under the EnerGuide for Houses program, the target of 10,000 house retrofits for the 2000-01 fiscal year has been exceeded, as 12,132 existing houses were evaluated and labeled. In 2000, 73 percent of all R-2000 homes certified in Ontario were built in rural communities and 65 new houses were registered in Nova Scotia for a cumulative number of 1,012 R-2000 houses in this province. Information on energy efficiency at home, at work and on the road is available at <http://oec.nrcan.gc.ca>.



In businesses and institutions – Over the 2000-01 fiscal year, the Commercial Building Incentive Program contributed more than \$2.5 million towards 58 projects, many of these

in remote and northern locations, with participants ranging from First Nation communities to McDonald's Canada. The following are a few examples. In Saskatchewan, the Silverspring School realized a 37 percent energy saving and the Manahik Waskahigan School installed an effective heat recovery system, which resulted in a 51 percent energy saving. McDonald's Canada built ten restaurants to higher energy efficiency levels, the most of any participants in the program, including restaurants in Slave Lake and Fort McMurray, Alberta. As well, there are new energy efficient buildings in the following Aboriginal communities: the Mishkeegogamang First Nations School in Osnaburgh, Ontario; the Mohawk Immersion School in Kanasatake, Quebec; the Nminahik Waskahigan School in Pinehouse, Saskatchewan; and the Cree Village Ecolodge, developed by the MoCreeBec, where the Moose River empties into James Bay. The latter is an eco-tourism resort with low energy buildings and furnishings chosen with the environment in mind, and featuring a great hall designed after the Cree traditional winter dwellings. Details and images may be found at: <http://www.creevillage.com/>.

Fuel cells for transportation – Transportation is a prime contributor to noxious emissions in Canada (45 percent of nitrous oxide emissions, 27 percent of volatile organic compounds, and 10 percent of harmful particulates). This is an aggravated problem in Canada's larger urban centres. Fuel cell technology, a technology in which Canada has a world-leading product, converts energy into power through an electro-chemical rather than thermo-mechanical process. Fuel cells, using hydrogen produced from renewable energy, offer the benefit of zero emissions with the performance and range advantages of fuel-powered, internal combustion systems. NRCan is working in partnership with other government agencies

and industry to develop, promote and deploy advances in adapting fuel cells to power automobiles; technologies for safe storage of hydrogen in transportation and other applications; and a hydrogen fuel infrastructure. With \$5 million in support for transportation S&T, NRCan has been instrumental in the installation of Canadian fuel cells in zero-emission demonstration vehicles, improvements in tanks for safe storage of hydrogen, and the installation of hydrogen fuelling stations.

Climate change, impacts and

adaptation – Recognizing that pro-active adaptation will reduce the risks to Canadians posed by a changing climate and enhance our ability to take advantage of economic opportunities that arise, NRCan has taken the lead in activities that will build a foundation for action on adaptation to climate change. Three elements are critical: research to provide detailed, client-focused information on the impacts of, and adaptation to climate change; increasing the number of researchers and stakeholders working on the issue; and more efficient transfer of the latest scientific results to decision-makers. Canada's *Action Plan 2000 on Climate Change* will provide increased resources to help meet these needs.

NRCan established the Adaptation Liaison Office to manage the \$7.5 million Impacts and Adaptation Program of the CCAF. The program's objective is to improve our knowledge of Canada's vulnerability to climate change, build a foundation upon which appropriate decisions on adaptation can be made, and to better assess the risks posed by climate change. NRCan's research community has increased its impacts and adaptation research efforts and forged stronger links with stakeholders to ensure that project results better reflect their needs. Details on key research

results can be found in a quadrant format on page 34.

A new PARC on the Prairies!!!

Working with provincial agencies, NRCan established the Prairie Adaptation Research Cooperative (PARC) in Regina. Greater awareness and involvement of Prairie-based researchers and stakeholders is facilitated in collaborative impacts and adaptation projects in Alberta, Saskatchewan and Manitoba. As a result, PARC-supported research is providing new insights into forest and water resource management, agriculture, and the adaptability of large and small Prairie communities to a changing climate.

NRCan is leading the development of the Canadian Climate Impacts and Adaptation Research Network to facilitate the faster spread of research tools, techniques and the latest scientific results. A series of regional and sectoral workshops were held across the country to engage researchers and stakeholders in the design of the research network to ensure that it meets their needs. Regional nodes of the network were established in British Columbia, the Prairies and Atlantic Canada.

Environmental influence of NRCan's

S&T – In the previous performance report, NRCan reported on performance indicators relating to GHG emissions and trends in energy efficiency. To help complete the indicator picture of the environmental influence of our S&T and stewardship practices, refer to the quadrant on page 35 for accomplishments on initiatives that address pollutants other than GHG.

Reducing greenhouse gas emissions in cement production – Concrete is one of the

most widely used building materials in the world — easy to make, strong and durable, versatile in many uses from construction to art work. Because of its many attributes, concrete

use has been expanding and further growth is expected in the foreseeable future. Annual worldwide production of Portland cement is expected to rise from 1.4 billion tonnes in 1995 to 2 billion tonnes in 2010. However, the manufacturing of cement and concrete – as with many other industrial materials – results in considerable energy consumption, GHG emissions (about one tonne of CO₂ released per tonne of manufactured cement), and gradual depletion of natural resources. In 1996, Canadian cement and concrete production emitted over 10 megatonnes of CO₂, about two percent of Canada's total GHG emissions. Therefore, to reduce energy consumption and GHG emissions, and preserve resources, NRCan's International Centre for Sustainable Development of Cement and Concrete (ICON) has developed high-performance concrete in which up to 60 percent of Portland cement is replaced by supplementary building materials (SCMs). SCMs consist of industrial by-products and natural materials that can partially replace Portland cement in concrete. The use of SCMs in concrete improves its durability and mechanical properties in comparison to conventional concrete made from Portland cement. The high-performance, high-volume fly ash (HVFA) concrete technology developed by ICON's researchers consists of 55 percent fly ash – a fine powder emitted by coal-fired electricity generating stations that is normally disposed of in landfills. ICON's goal is to expand the use of HVFA concrete in various applications across Canada and abroad. In Canada alone, the production of HVFA concrete could expand to two megatonnes per year and reduce CO₂ emissions by an equal amount.



Liu Centre at UBC (photo courtesy of the EcoSmart™ Partnership)

Based on HVFA technology, NRCan, in partnership with Environment Canada, Industry Canada and the Greater Vancouver Regional District, developed EcoSmart™ concrete, in which the proportion of SCMs for a specific application is optimized. In collaboration with local cement and concrete producers, EcoSmart™ was used in several construction projects, including the construction of:

- the Liu Centre for Global Studies, on the campus of the University of British Columbia (B.C.);
- the B.C. Coastal Operational Facility;
- Cranberry Commons, a 22-unit sustainable co-housing development in B.C.;
- the Artist Live-Work Studios on Granville Island, B.C.; and
- the Computer Science Building on the campus of the University in Toronto, Ont.

Conserving and protecting Canada's forest ecosystems while enhancing timber supply – As a

signatory to the United Nations Convention on Biological Diversity, Canada is committed to managing its forest resources in a sustainable manner to conserve biodiversity and to maintain the productivity and resilience of its forests. The Department pursues this commitment through forest policy development

activities and five world-class forest science research centres located across Canada. The following are some recent examples of significant scientific breakthroughs aimed at protecting Canada's forests while increasing timber supply.

NRCan researchers from the Great Lakes Forestry Centre (GLFC), in collaboration with the University of Guelph, conducted a controlled environmental release of a genetically modified micro organism onto a GLFC-owned forest near Thessalon, Ontario. The first such experiment to be conducted in Canada will help increase our understanding of the environmental behaviour of genetically modified viruses, and to the development of test methods to assess the environmental safety of genetically modified viral insecticides.

The Department, in collaboration with the B.C. Ministry of Forests, the University of B.C., Simon Fraser University, CELLFOR, and Pacific Forest Products, made significant strides in using host resistance as a biological alternative to chemical pesticides. The method of genetically screening naturally resistant trees to forest damaging insects is being used to regenerate the Sitka and White spruce in the coastal and interior regions of B.C. against the White Pine Weevil. This particular experiment, which represents the most comprehensive genetic screening project in the world, also led to an important discovery in the ways spruce trees resist to weevil attacks.

The success of spray programs against insect pests often depends on timing the application for when pests are most vulnerable. BioSIM, a computer modelling environment developed by the Department's forest research scientists at the Laurentian Forestry Centre in Saint-Foy, Quebec, uses knowledge of an insect's response to temperature to help forest

managers determine the best time to strike. In 1999 and 2000, the Department, in collaboration with the B.C. Ministry of Forests, used BioSIM to time multimillion-dollar spray programs to eradicate the gypsy moth from southern Vancouver Island and the Vancouver area. BioSIM is also being used in Canada and the U.S. to predict a wide-variety of insect populations such as the spruce budworm, gypsy moth, and eastern hemlock looper.



NRCan scientist working with plants in a lab

Premised on the BioSim model, a computer-based protection planning system (PROPS) was developed to allow forest managers to schedule harvest and silvicultural treatments to reduce expected losses to spruce budworm. In collaboration with Repap New Brunswick Inc. and J.D. Irving Ltd, PROPS for spruce

budworm outbreaks is now being implemented throughout the province of New Brunswick and test land bases in Alberta, Saskatchewan, Quebec and Ontario.

The Department continued to develop the Extended Collaboration to Link Ecophysiology and Forest Productivity (ECOLEAP) project – a multi-disciplinary project that integrates current knowledge of tree growth processes with satellite data, site characteristics and climate change information to assess the effects of environmental factors on future forest productivity by tree species. For example, field data, compiled on balsam fir and sugar maple at sites extending from New Brunswick, Quebec and eastern Ontario is being used to produce future forest productivity estimates for these sites. As well, empirical procedures have been developed for estimating potential growth of four boreal forest commercial species based on climactic indices.

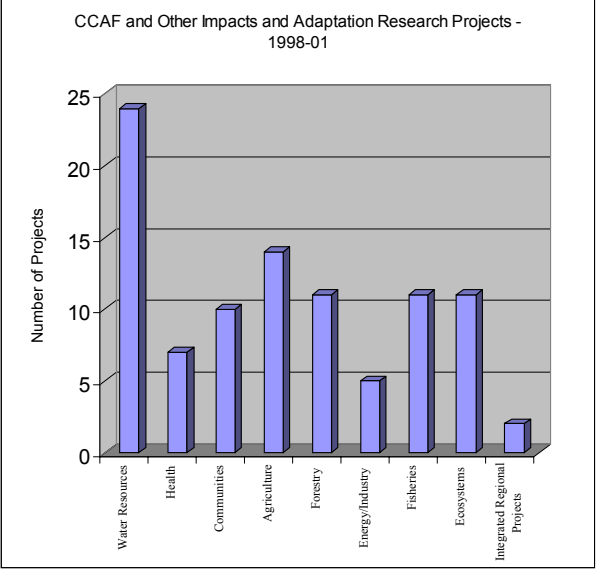
The Department, in collaboration with Agriculture and Agri-food Canada, developed a new Canadian Plant Hardiness Zone map employing modern statistical methodologies, geographic mapping techniques and incorporating climate data not previously available in the original 1967 version. The map, a precise spatial image of geographic areas statistically associated with plant survival, serves as a plant growing guide to Canadian gardeners and producers.

Climate change, impacts and adaptation....

Objective: Canada addressing its international Kyoto commitment to reduce greenhouse gas emissions.

Performance indicator: Progress towards the identification of impacts and adaptation measures.

Target: To be determined.

 <p>CCAF and Other Impacts and Adaptation Research Projects - 1998-01</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Number of Projects</th> </tr> </thead> <tbody> <tr> <td>Water Resources</td> <td>24</td> </tr> <tr> <td>Health</td> <td>7</td> </tr> <tr> <td>Communities</td> <td>10</td> </tr> <tr> <td>Agriculture</td> <td>14</td> </tr> <tr> <td>Forestry</td> <td>11</td> </tr> <tr> <td>Energy/Industry</td> <td>5</td> </tr> <tr> <td>Fisheries</td> <td>11</td> </tr> <tr> <td>Ecosystems</td> <td>11</td> </tr> <tr> <td>Integrated Regional Projects</td> <td>2</td> </tr> </tbody> </table>	Category	Number of Projects	Water Resources	24	Health	7	Communities	10	Agriculture	14	Forestry	11	Energy/Industry	5	Fisheries	11	Ecosystems	11	Integrated Regional Projects	2	<p><u>NRCan's Contribution</u></p> <ul style="list-style-type: none"> • The Climate Change Action Fund (CCAF) Impacts & Adaptation program, managed by NRCan's Adaptation Liaison Office, provided funding for 76 projects that increased the understanding of impacts and contributed to adaptation measure development across the country. • NRCan's A-base supported 16 projects in its core areas of expertise - landscapes, hazards, energy, water resources and coastal zone management. Key results included: <ul style="list-style-type: none"> – analysis of the risks of sea level rise for Charlottetown, Prince Edward Island and development of a storm surge model to provide warnings for current storms; – estimates of the risk posed by permafrost degradation to infrastructure in two northern communities and a template for analysis of other northern communities; – development of a model for road and pipeline route selection in terrain underlain by permafrost; – the first estimates of the impacts of climate change on Canadian groundwater resources; – identification of key gaps and climate change impacts and adaptation research priorities in Canada's North. • NRCan also worked on research aimed at assisting forest managers plan for the future by providing insights into regional implications of fire, pests, disease and winter dieback. NRCan research, based on sophisticated simulation models, suggests that the average area burned may increase by as much as 50 percent over the next 50 years and may be increasing already. This increase would mean about one percent of Canada's forest would burn every year and much of that would probably not regenerate as forest. • For additional information, refer to: http://www.adaptation.nrcan.gc.ca
Category	Number of Projects																				
Water Resources	24																				
Health	7																				
Communities	10																				
Agriculture	14																				
Forestry	11																				
Energy/Industry	5																				
Fisheries	11																				
Ecosystems	11																				
Integrated Regional Projects	2																				
<p><u>What Does the Graph Mean?</u></p> <ul style="list-style-type: none"> • The graph demonstrates the increased impacts and adaptation research activity on key topics. The largest increase is in the water resources sector, information which is critical to other sectors such as agriculture and communities. 	<p><u>Next Steps</u></p> <ul style="list-style-type: none"> • The extension of the CCAF, along with the Government of Canada <i>Action Plan 2000</i>, will result in a tripling of the investment in the Impacts and Adaptation Program. Greater emphasis will be placed on adaptation measure development. • In addition to increased research activity, a Canadian Climate Impacts and Adaptation Research Network will become fully operational in 2001. It will help engage new expertise and stakeholders, and facilitate faster exchange of research results. 																				

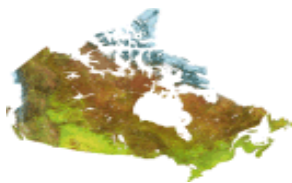
Environmental influence of NRCan's S&T....

Objective: Scientific research, technologies and stewardship practices that reduce environmental impacts, conserve biodiversity, and increase the efficiency of resource development and use.

Performance indicator: Environmental influence of NRCan's S&T and stewardship practices.

Target: Maintain or improve NRCan's influence.

<p style="text-align: center;">Annual average levels of air pollutants in Canadian cities</p> <p>Actual levels in parts per billion (ppb), 1985: carbon monoxide (CO) 976 ppb; nitrous oxide (NO₂) 21 ppb; ground-level ozone (O₃) 17 ppb; sulphur dioxide (SO₂) 6 ppb; and total suspended particulates 43 ppb.</p> <p>Source: Environmental Protection Service, Environment Canada, 1999</p>	<p><u>NRCan's Contribution</u></p> <p>NRCan addresses the issue of air quality by developing and promoting technologies, programs and new knowledge for the reduction of pollutants generated through the production, conversion and use of energy. Initiatives include:</p> <ul style="list-style-type: none"> • developing and promoting technologies and processes for greater energy efficiency, such as lightweight materials, integrated industrial processes, and energy efficient buildings, reducing the use of fossil fuels; • developing advanced combustion and pollution abatement technologies for efficient stationary combustion processes; • improving the removal of hazardous air pollutants from transportation vehicles and coal-fired power plants; • developing clean-burning alternative fuels and advanced propulsion systems (e.g. gaseous fuels, alcohols, biofuels, hydrogen, fuel cells, electric vehicles and hybrids, and related systems); and • improving biomass production technology for biofuels from forest residues, including harvesting residues, non-commercial timber and brush species.
<p><u>What Does the Graph Mean?</u></p> <ul style="list-style-type: none"> • The graph shows the annual average levels of five significant air pollutants in Canadian cities. • Most air pollution is the result of combustion of fossil fuels in vehicles, home furnaces, industrial operations and thermal power generation plants. • All pollutants except O₃ show a general downward trend, in spite of urban growth and an increase in the number of emission-producing activities, such as an increase in the number of vehicles. • The source of O₃ (the result of sunlight on nitrogen oxides and volatile organic compounds such as benzene, which comes primarily from unburned gasoline in vehicle exhausts) in Canadian centres is frequently from the United States. 	<p><u>Next Steps</u></p> <ul style="list-style-type: none"> • NRCan's initiatives, undertaken in partnerships, will help reduce the adverse impacts from global warming, acid rain and smog, especially in urban areas. • In February 2001, the Government of Canada announced an investment of \$120 million in new measures to accelerate action on clean air, including in the areas of cleaner fuels, reduction of smog-causing emissions from industrial sectors, and abatement technologies for particulates. • As well, through its federal Program of Energy R&D (PERD), NRCan will continue to target cleaner and more fuel efficient transportation, as well as reduced industrial emissions. New technologies such as fuel cells, and electric and hybrid vehicles are at various stages of development but will need some time before they impact urban air quality and regulations governing trans-boundary air pollutants. • A key factor in improving vehicle efficiency is its weight — for every 10 percent reduction in vehicle weight, there is a six to eight percent improvement in fuel efficiency and a reduction in the release of atmospheric pollutants. NRCan will continue to coordinate the Canadian Lightweight Materials Research Initiative (CLiMRI), a government/industry partnership, whose research areas include technologies for the design of lightweight materials, and manufacturing processes to produce parts from these materials to be used in transportation applications.



Strategic Outcome #4 - To provide Canadians with safety and security in the natural resources sector.
Expenditures 2000-01: \$28.4M

Short to medium-term objectives	Performance Indicators	Departmental Priorities for 2000-01	Speech from the Throne Themes
<p>Canadians safeguarded from natural hazards.</p> <p>A national framework for spatial positioning, mapping and boundary maintenance.</p> <p>Safe use of explosives and pyrotechnics.</p> <p>Enhanced safety and security in Canada's natural resources sector.</p>	<p>Impact of NRCan's S&T on the identification, mitigation and response to natural hazards.</p> <p>User satisfaction with aeronautical charts, the Canada Lands Survey System and the Canadian Spatial Reference System.*</p> <p>Accident and incident rate in the explosives and pyrotechnic industries in Canada.</p> <p>Impact of regulatory frameworks for energy transmission, offshore development, and Canada's uranium and nuclear industry.</p>	<p>Health and Safety</p> <p>Deliver on mandated responsibilities for the health and safety of Canadians in regard to explosives, geological survey and mapping.</p>	<p>Creating Opportunity</p> <ul style="list-style-type: none"> • Innovation • Skills and learning <p>Sharing Opportunity</p> <ul style="list-style-type: none"> • Strong and safe communities

* Performance information on this specific indicator is presented in a quadrant format on page 40.

What we have accomplished.....

Mitigating the impacts of natural disasters and responding to Canadians in emergencies

– Canada is prone to a diversity of naturally occurring geological hazards and sensitive environmental conditions (e.g. earthquakes, landslides, storms). Canadians are increasingly concerned with personal health and safety, the long-term integrity of the infrastructure and the effects of

human activities on the environment. NRCan's geoscientific information helps provide an understanding of these processes for avoiding, mitigating or adapting to existing conditions. This leads to better awareness, health and safety policies, and renewed building codes. Earthquake hazards are monitored on a daily basis and information is available at <http://www.seismo.nrcan.gc.ca>. Information

regarding magnetic storms, a principal cause of major electrical blackouts, is available at <http://www.geolab.nrcan.gc.ca>.

Mitigating the impact of these occurrences and responding to search and rescue and other emergencies is critical. NRCan's topographical maps and charts, satellite imagery and geodetic information also assist decision-makers at all levels of governments and agencies in emergency response and planning. Increasingly, the demand for information has provoked the necessity for governments, including First Nations, to work together and share their knowledge about their road networks to create emergency response systems. Progress in this area has been made by the GeoConnections ground transportation group and the Sustainable Communities component of the program (refer to pages 5 and 19).

Meeting Canadians' energy safety and security needs – On April 25, 2001, the Government of Canada took a major step forward in dealing with nuclear fuel waste in Canada by introducing new legislation. The *Nuclear Fuel Waste Act* is the culmination of many years of federal research, environmental assessments and discussions with stakeholders, including the nuclear industry, provinces and the public (the Bill can be found at <http://www.nuclear-nrcan.gc.ca> under "What's New").

The Act calls for nuclear utilities to form a waste management organization that would report regularly to the government. This organization would develop long-term waste management options for government approval. The Act would also require that utilities establish a trust fund to finance the

implementation of the government-approved option, which would ensure that Canadian taxpayers are not exposed to this financial liability over the long term. Federal oversight is required to ensure that nuclear fuel waste is taken care of in a comprehensive, cost-effective and integrated manner per the government's 1996 Policy Framework for Radioactive Waste. This is an important concern as the management of nuclear fuel waste is a major undertaking that could cost up to \$13 billion and span 70 to 100 years. The *Nuclear Fuel Waste Act* builds on the 1998 government response to the Seaborn review. The introduction of new legislation clearly demonstrates that we are committed to overseeing the long-term management of nuclear waste in the best interest of Canadians.

Clean-up of historic radioactive waste in the Port Hope Area, Ontario – Historic low-level radioactive waste in the Port Hope area originated from radium and uranium refinery operations that began in the 1930s. Since the mid-1970s, the Government of Canada has endeavored to clean up the local contaminated areas and find a site(s) for the long-term management of the waste. Developing a solution required public support, public confidence and public participation in decision-making. For many years, the government has been in consultations, not only with local communities, but with other potential host communities in the province of Ontario. A milestone occurred this year when an agreement was reached between the government and local communities, setting out the terms of the clean-up which involve long-term management of the waste in the local area. The agreement marks the beginning of a ten-year multi-phase \$260 million project which will result in the clean-up and safe management of the wastes in the long term;

\$30 million has already been distributed to the affected communities. This success is a clear demonstration that good cooperation between the government and local communities can lead to solutions and counter the “not in my backyard” syndrome often encountered in siting any waste facility.

Connecting micropower to the grid



Microturbine unit providing 75 kW of electrical power as well as heat to a Health Canada building in Toronto (photo courtesy of Mercury Electric Corporation).

There is a growing demand globally for environmentally friendly power, generated with solar panels, wind turbines, fuel cells and microturbines. NRCan has demonstrated the use of microturbines for generating power from municipal waste gases. The connection of small, privately owned electricity generators to the public power system must be done in a way that is both safe and efficient. NRCan has reviewed micropower interconnection issues and related codes, standards and guidelines in Canada for four emerging technologies – photovoltaic, microturbines, fuel cells and on-site wind turbines, addressed issues related to the reliability of the electrical grid and the safety of workers (www.micropower-connect.org), and submitted changes to the Canadian Electrical Code (Section 50) to establish rules for the safe installation of photovoltaic power sources for both off-grid and grid-connected applications in Canada.

Ensuring pyrotechnic safety – Over the past decade, Canada’s fireworks and pyrotechnics industries have experienced rapid growth as a result of the Canadian public’s desire for fireworks displays and the rapid expansion of our film industry. However, the strong growth led to an increase in the number of accidents in the late 1990s.

In 1999, six serious incidents occurred. These accidents took an unacceptable human toll and caused damages exceeding \$2 million. In response to these accidents, NRCan, the federal government’s primary source of expertise on explosives regulations and technology, strengthened its inspection and training programs in the fireworks industry. The increased focus on the fireworks industry most likely contributed to a reduction in fatalities in this industry over the past two years. In 2000-01, no fatalities occurred in Canada’s fireworks industry.

Did you know?

- the number of international fireworks competitions hosted in Canada increased five-fold over the last decade;
- the millennium celebrations increased the demand for fireworks;
- pyrotechnics in the movie industry is increasing at 30 percent per year; and
- high-power amateur rocketry has significantly increased after being virtually non-existent in 1990.

During 2000-01, a web-based lesson plan – the Explonet Family Fireworks Safety Education Module – was officially made available to assist teachers to raise awareness of the safety issues surrounding fireworks. This module was developed by NRCan, in partnership with provincial educators and national health officials, with the goal of reducing unnecessary injuries due to improper use of fireworks in family fireworks displays. Explonet strongly

promotes adult and professional supervision for the use of these enticing, but potentially dangerous items. The program is targeted at pupils from grades four through seven. Because of its innovative use of graphics, interactive questionnaires, quizzes and other attractions, the module has been highly successful with children and their teachers. It can be found on the Explonet web site at <http://www.nrcan.gc.ca/explonet>.



Effects of experimental explosion on a pile of fireworks.

In April 2000, NRCan organized and hosted the 5th International Symposium of Fireworks in Naples, Italy. This successful event provided industry with an opportunity to exchange information during the sessions on pyrotechnic research. Approximately 200 attendees from 25 countries benefitted from more than 40 technical presentations on a variety of fireworks-related topics including safety, regulation, research and art.

The Department undertakes innovative fireworks research, and tests and certifies products. For example, in 2000-01, NRCan undertook research on the effects of an explosion in piles of fireworks stored in warehouses and improved the chemical analysis of fireworks, using ion chromatography, to ensure that products are consistent with manufacturers' declarations.

Understanding the importance of the Canadian Spatial Reference System –

There is a vast array of technology currently available to help ensure engineering success. What would happen if these technologies did not share a consistent coordinate system?



Consequences of using inconsistent coordinate systems (photo courtesy of Zurich North America Inc.).



The Canadian Spatial Reference System bridges the gap.


Why do we need a Canadian Spatial Reference System (CSRS)? To provide a national framework for geospatial referencing in Canada. Its use results in compatibility and supports sustainable development, identifying data as a resource for building knowledge and avoiding possible negative outcomes aptly illustrated in the picture above. Information on user satisfaction with the CSRS can be found on the following page.

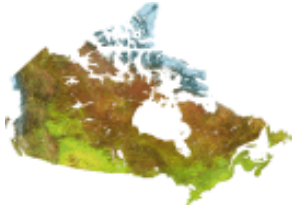
Understanding the importance of the Canadian Spatial Reference System....

Objective: A national framework for spatial positioning, mapping and boundary maintenance.

Performance indicator: User satisfaction with the Canadian Spatial Reference System.

Target: Maintain standards.

 <p>Client Satisfaction Rating</p> <table border="1"> <thead> <tr> <th>Category</th> <th>Very Satisfied (%)</th> <th>Satisfied (%)</th> <th>Neutral (%)</th> <th>Dissatisfied (%)</th> </tr> </thead> <tbody> <tr> <td>Timeliness</td> <td>75</td> <td>25</td> <td>0</td> <td>0</td> </tr> <tr> <td>Access of Staff</td> <td>60</td> <td>40</td> <td>0</td> <td>0</td> </tr> <tr> <td>Staff Knowledge</td> <td>65</td> <td>35</td> <td>0</td> <td>0</td> </tr> <tr> <td>Staff Helpfulness</td> <td>75</td> <td>25</td> <td>0</td> <td>0</td> </tr> <tr> <td>Staff Courtesy</td> <td>85</td> <td>15</td> <td>0</td> <td>0</td> </tr> <tr> <td>Availability of Service</td> <td>55</td> <td>40</td> <td>5</td> <td>0</td> </tr> <tr> <td>Handling of Problems</td> <td>40</td> <td>30</td> <td>30</td> <td>0</td> </tr> </tbody> </table>	Category	Very Satisfied (%)	Satisfied (%)	Neutral (%)	Dissatisfied (%)	Timeliness	75	25	0	0	Access of Staff	60	40	0	0	Staff Knowledge	65	35	0	0	Staff Helpfulness	75	25	0	0	Staff Courtesy	85	15	0	0	Availability of Service	55	40	5	0	Handling of Problems	40	30	30	0	<p><u>NRCan's Contribution</u></p> <p>The Canadian Spatial Reference System (CSRS) enhances NRCan's service to the natural resources sector and a multitude of other sectors as a component of national standards, serving as the foundation of highest accuracy for spatial positioning throughout Canada:</p> <ul style="list-style-type: none"> • NRCan's Geodetic Survey Division leads the Canadian Geodetic Reference System Committee, a collaboration of provincial/territorial agencies and principal driver for decisions related to the CSRS; • global compatibility is assured through NRCan's participation and leadership roles in the International GPS Service and the International Intercomparison of Absolute Gravimeters, and acceptance of the Algonquin and Yellowknife Radio Observatories into the International Very Long Baseline Interferometry Service; and • from engineering works and navigation, to environmental science and climate change studies, the CSRS serves as a framework for knowledge-based decisions with direct application to location commerce and a growing list of disciplines.
Category	Very Satisfied (%)	Satisfied (%)	Neutral (%)	Dissatisfied (%)																																					
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<p><u>What Does the Graph Mean?</u></p> <ul style="list-style-type: none"> • This graph depicts key results of a monthly Client Satisfaction Survey of direct clients (contact by telephone, fax or in person) of NRCan's Geodetic Survey Division, taken over 6 months. The survey questions are aligned to the Common Measurement Tool adopted by the Treasury Board Secretariat. • Respondents are located throughout Canada and are drawn from industry (62%), provincial (16%), and federal government agencies (17%), academia (3%), and other stakeholders (2%). • Clients appreciated the service received; all were satisfied with the service. • Most highly rated was the timeliness of response to requests for information related to Geodetic Survey's GPS corrections and tracking station data, traditional vertical and horizontal survey control data, publications, software, etc. • Individual suggestions for improvement will influence internal planning. For example, a number of clients recommended making additional information available on-line. Easily implemented improvements have been actioned quickly. 	<p><u>Next Steps</u></p> <ul style="list-style-type: none"> • Service improvements based on future surveys, using the same core questions as baseline, aim to achieve the government's target of a minimum 10% increase in client satisfaction by 2005. • An action plan, based on this and another survey of provincial stakeholders, is in progress. This includes easier online access to more geodetic data and powerful online positioning applications. • Advances in technology will drive the reactions of a rapidly evolving client base, implicating the following key actions: <ul style="list-style-type: none"> - improve the robustness of the infrastructure for GPS Corrections in support of the provincial, federal and territorial collaboration for distribution via the Canada-wide DGPS initiative; - focus on Space Geodesy as the CSRS core, with accurate positioning applications extending to natural hazards and meteorology, among others; and - increase the capacity of the North as a partner in the CSRS, including improvement of the vertical reference system, to participate in benefits comparable to those available in southern Canada. • NRCan will continue to monitor the satisfaction of clients using these services. 																																								



Strategic Outcome #5 - To provide Canadians with a department that is efficiently and effectively managed.

Expenditures 2000-01: \$65.9M

Short to medium-term objectives	Performance Indicators	Departmental Priorities for 2000-01	Speech from the Throne Themes
<p>Managing NRCan's resources responsibly.</p> <p>Continuous improvement of NRCan's products, services, and operations.</p> <p>Sustainable development in NRCan operations.</p>	<p>Employee satisfaction with NRCan management practices.</p> <p>Progress towards maintaining and enhancing NRCan's program integrity.*</p> <p>Savings realized from streamlining administrative processes, innovative service delivery, electronic commerce, improved facilities management, and information technology bulk purchasing and contracts.</p> <p>Implementation of recommendations from audits, evaluations and other studies of NRCan management and operations.*</p> <p>Progress of the Department's Environmental Management System towards the implementation of ISO 14000 series of standards.</p> <p>Progress towards the implementation of environmental health and safety audits and environmental assessment evaluation of NRCan operations.*</p> <p>Amount of solid non-hazardous waste from NRCan operations per capita per year.</p> <p>Portion of fleet converted to alternative fuels.</p> <p>Rate of purchasing by NRCan of green power.*</p>	<p>Overall Management Effectively manage NRCan in a manner which is responsive to changing priorities; to demonstrate interdepartmental leadership in addressing management challenges; and to ensure NRCan's workforce has the right skills and expertise to meet the Department's commitments and obligations now and in the future.</p> <p>S&T Excellence Continue to ensure that NRCan's S&T efforts follow the S&T excellence principles outlined in the Council of Science and Technology Advisors framework on Science and Technology Excellence in the Public Service.</p>	<p>Sharing Opportunity</p> <ul style="list-style-type: none"> • Clean environment <p>Celebrating Canadian Citizenship</p> <ul style="list-style-type: none"> • Public service

* Performance information on these specific indicators is presented in a quadrant format on pages 46-49.

What we have accomplished.....

Today's climate of continual change has given rise to several departmental and government-wide management initiatives which need to be prioritized and properly managed with finite resources. This strategic outcome is about sound departmental management and effective decision-making within this environment of change.

Over the past 12 months, NRCan has moved on multiple fronts with a view to continuously improving its management practices. Our active involvement in, for example, the modern comptrollership initiative, the Financial Information Strategy (FIS), and comprehensive employment equity and diversity initiatives, are only a few of the major efforts to help the Department address the important management issues of the day.

Advancing approaches to modern management – Modern comptrollership is aimed at fostering a results-based management regime based on leadership and values, well-defined standards, and sound risk management with the right systems in place to ensure optimum decision-making.

NRCan's modern comptrollership self-assessment indicated that the Department could improve in a number of areas including modernizing methods of prioritizing its strategic directions and realigning its resources, strengthening monitoring and performance reporting, and developing and implementing risk management and ethics and values frameworks.

As a result, significant progress has been made on implementing modern comptrollership or modern management since 1999. This progress

includes a performance measurement framework and a unique performance indicator format to inform Parliamentarians and Canadians of progress made towards advancing sustainable development and good governance. The Department has been recognized for this progress by the Auditor General of Canada and the Commissioner of the Environment and Sustainable Development.

Did you know?

NRCan's Aeronautical and Technical Services (ATS) has recently won the prestigious Canada Award for Excellence trophy. ATS is the first Government of Canada organization honored by the National Quality Institute with the award, which recognizes outstanding organizational achievement and excellence in implementing quality principles and practices. There are an additional eleven units within the Department that have received ISO 9000 registration, a standard for quality management systems that has been developed and accepted internationally as a method of providing assurance of product/service quality. See the annex on external recognition (page 63) for more information on this award.

NRCan has also been very active in strengthening its financial and contract management functions and becoming FIS compliant on April 1, 2001. The latter involved the implementation of accrual accounting, valuation and capitalization of fixed assets, new chart of accounts, payments scheduling, interfaces with central agencies, system changes, and policies and procedures. Thus far, formal FIS training has been provided to more than 200 employees in both the National Capital Area and the regions. In addition, over the course of the year, more than 100 employees received contract training, with another 200 staff scheduled to upgrade their contracting skills in the new year.

Similarly, NRCan has developed an approach to implementing an integrated risk management framework (IRMF) that is consistent with the Treasury Board's IRMF and with the Treasury Board Secretariat Active Monitoring Policy. A dialogue on ethics through case studies and awareness sessions is well under way, as are courses on harassment awareness, ethics and conflicts of interest. To date, more than 90 percent of NRCan employees have received harassment awareness training.

Building a strong and diverse workforce – NRCan is committed to attracting and retaining a highly skilled, knowledgeable and diverse workforce and supporting employees in their continuous learning and career development.

In this regard, NRCan's human resources management efforts over the past year focused on several key areas: enhancing the diversity of our workforce; formalizing and providing learning and career development opportunities; and making better use of technology to deliver enhanced services to departmental managers and employees. The work completed builds on NRCan's Retention, Rejuvenation and Recruitment (3R) Strategy, as well as our employees' responses to the 1999 Public Service Employee Survey.

Over fiscal year 2000-01, the Department actively developed tools and mechanisms to encourage and promote a workforce that is representative of Canada's diverse population. NRCan is extremely proud of the fact that it successfully received approval from the Public Service Commission for an *NRCan Expanded Employment Equity Program*. This program, along with our *Employment Equity Action Plan*, and our *A Manager's Guide to*

Employment Equity, Diversity and Making NRCan a Workplace of Choice will significantly enhance managers' efforts to attract and retain designated group members. Recognizing the importance of learning in attracting and retaining a diverse, talented and skilled workforce led NRCan to develop and implement several significant tools, and to formalize our Learning and Employee Development Strategy (LEDS). The tools and mechanisms available to our employees include learning events, career planning and development workshops and mentoring programs. The LEDS is the foundation for our managers and employees to ensure that all employees have the skills necessary to do their work.

Finally, our employees have encouraged the Department to continue to strive for innovative ways to streamline and enhance processes. For example, NRCan developed a time-saving, bilingual, barrier and bias-free Statement of Qualifications web-based tool that has generated great interest among other departments. We have also piloted an On-Line Leave system which automates the leave request and approval process. Finally, the Manager View of our Human Resource Information System is currently being rolled out to all departmental managers so that they can easily access job-related information about their employees.

Did you know?

As an employer of choice, NRCan employs a diverse, national workforce of approximately 4,600 employees including world-class research scientists, technicians, field workers, economists, policy experts, commerce officers and administrative staff.

Actively managing our real property infrastructure – Over the reporting period, NRCan has developed a Real Property Management Framework to guide investments in our portfolio of assets and begin to address the rust-out of our capital holdings, as well as tackle long-standing health and safety deficiencies. Outputs associated with this process include a Mid-Term Investment Program and an integrated approach to our annual work planning process. Life cycle asset management plans have also been put in place for all major facilities in the inventory and these are linked to an annual work planning cycle. These initiatives have been linked to a five-year Safety and Health Special Effort (2000-05) program which is designed to reduce risks in the operation and maintenance of our assets. See page 48 for more information on progress towards the implementation of environmental health and safety audits and an environmental assessment evaluation of NRCan operations. For information on the implementation of recommendations from audits, evaluations, and other studies of NRCan management and operations, see page 47.



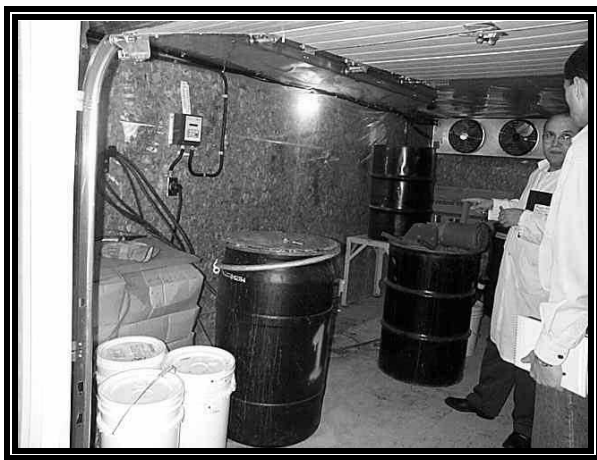
NRCan has 315 real property assets nationally with a total replacement value of more than \$1.0 billion.

Strengthening our information management (IM) / information technology (IT) – Rapid changes and advancements in IT continue to have an impact on the Department. In response to increasing pressures to support our employees with high- performing and reliable systems, NRCan completed a Capacity Management Survey and Plan. Initial input into this exercise played an important role in the Department's program integrity submission to Treasury Board which resulted in investments aimed at mitigating some gaps identified in the survey. Reinvestment in our aging IT infrastructure will lay the groundwork for implementation of GOL initiatives (see page 5), a top priority across government. More information on progress towards maintaining and enhancing NRCan's program integrity can be found on page 46.

A preliminary review of electronic networks found that opportunities exist to strengthen some elements of the management control framework. As well, a preliminary review of electronic business identified the need to formalize the overall governance structure for electronic business. As a result, NRCan has embarked on a review of governance and accountability structures around both IM and IT with a view to seeking out best practices and identifying improvements in support of greater delivery of service electronically.

Similarly, in response to the challenges of managing our considerable information holdings, NRCan identified IM areas requiring the most attention and embarked on an analysis of IM needs in the areas of policy, tools and resources.

Raising awareness of occupational safety and health – Major modifications were made to the *Canada Labour Code Part II* (Occupational Safety and Health) in September 2000, resulting in significant implications for management. In response to these changes, a series of awareness sessions was initiated for managers and Joint Occupational Safety and Health Committee members at NRCan to explain their revised roles, responsibilities and personal liabilities under the new code.



NRCan officials conducting environmental, health and safety audits of departmental operations.

Sharing expertise and advice in environmental assessments – During 2000-01, there was a significant increase in internal requests for expert advice on the

application of the *Canadian Environmental Assessment Act* (CEAA) to determine if, and when, an environmental assessment (EA) is required. As an indication that our EA training and awareness strategies are working, 27 internal projects for which an EA screening was needed were identified by departmental managers. In addition, during the course of the year, NRCan was involved in some 40 comprehensive, externally driven EA studies as well as three EA panel reviews in various stages.

In parallel to this, under the *Federal Coordination Regulations* of the CEAA, NRCan is obligated to provide expertise on a wide range of national cases involving other EAs. As a result, NRCan received 270 requests for assistance from other departments, becoming directly involved in 50 cases.

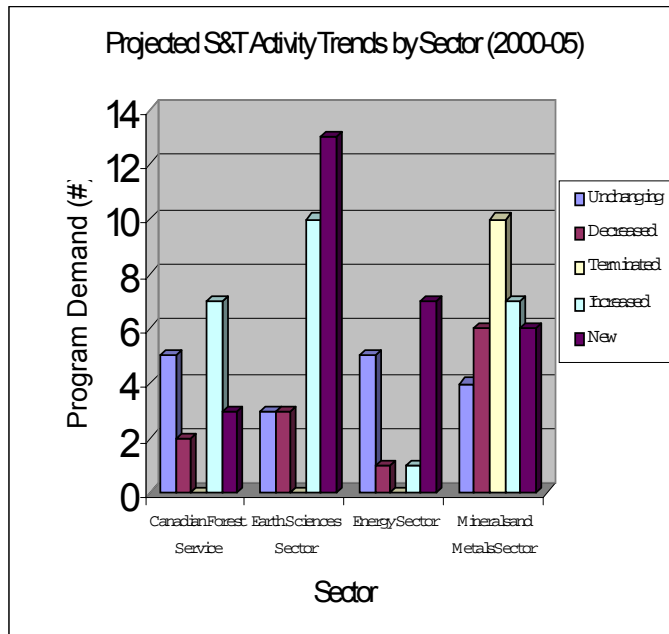
Promoting eco-efficiency – NRCan recognizes the importance of promoting the use of goods and services that are eco-efficient. Information on the rate of purchasing by NRCan of green power can be found on page 49.

Identifying our S&T capacity gaps....

Objective: Managing NRCan's resources responsibly.

Performance Indicator: Progress towards maintaining and enhancing NRCan's program integrity.

Target: To be determined.



NRCan's Contribution

- As part of an assessment of its ability to deliver its S&T programs, both currently, and those expected over the next five years, NRCan identified and fully costed* its current and anticipated S&T capacity gaps.
- This process required assessing anticipated levels of demand in all of its S&T program areas over the next five years.
- Scenario building such as this process is intended to lead to more strategic investment of S&T resources in order to maintain the integrity and effectiveness of the Department's S&T activities.
- NRCan has led, or participated, in the successful development of several significant S&T policy proposals designed to address federal government and departmental priorities. An example is the Targeted Geoscience Initiative (page 16).

* i.e., including costing of requirements for accommodation, special space needs, IT/IM, human resource support, etc.

What Does the Graph Mean?

- NRCan's Canadian Forest Service, Earth Sciences Sector, Energy Sector and Minerals and Metals Sector were asked to identify anticipated levels of program demands over a five-year period.
- The graph indicates levels of S&T program activity that are projected to remain unchanged, areas that will see activities decreased or terminated, and program areas that are expected to have an increase in activities or will be new to the Department.
- The graph indicates a bias towards an increase in present activities and new activities in each sector over the five-year period.

Next Steps

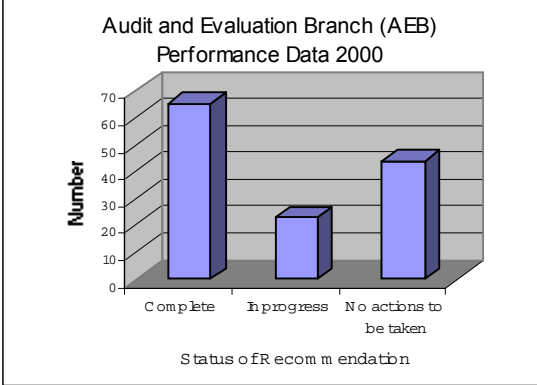
- An extensive review and prioritization of the Department's current and anticipated S&T gaps over the next five years will lead to the development of a long-term strategy to address the gaps. It will be aligned to other departmental initiatives, such as the Long-Term Capital Plan.
- In the longer term, this process will better position the Department for early identification of, and adjustment for, emerging S&T capacity issues.

Quality, efficiency and effectiveness of service....

Objective: Continuous improvement of NRCan's products, services and operations.

Performance indicator: Implementation of recommendations from audits, evaluations and other studies of NRCan management and operations.

Target: To be determined.

 <p>Audit and Evaluation Branch (AEB) Performance Data 2000</p> <table border="1"> <thead> <tr> <th>Status of Recommendation</th> <th>Number</th> </tr> </thead> <tbody> <tr> <td>Complete</td> <td>65</td> </tr> <tr> <td>In progress</td> <td>23</td> </tr> <tr> <td>No actions to be taken</td> <td>44</td> </tr> </tbody> </table>	Status of Recommendation	Number	Complete	65	In progress	23	No actions to be taken	44	<p><u>NRCan's Contribution</u></p> <ul style="list-style-type: none"> • Delivery of programs and services is only part of NRCan's mission. Objective feedback on the quality, efficiency and effectiveness of service is also essential. Audit and Evaluation Branch (AEB) carries out audits, evaluations, risk assessments, performance studies, and a range of other services with departmental managers, other government departments and central agencies to help NRCan carry out its many programs. • Follow-up studies are performed to ensure that recommendations made by AEB and the Office of the Auditor General are implemented, thus ensuring good governance. This is also a measure of AEB efficacy.
Status of Recommendation	Number								
Complete	65								
In progress	23								
No actions to be taken	44								
<p><u>What Does the Graph Mean?</u></p> <ul style="list-style-type: none"> • As a result of audits, evaluations and other studies in the year 2000, AEB made recommendations on 132 items that the Department should address. The graph indicates that 65 recommendations have been acted upon and completed with an additional 23 recommendations in progress of being actioned. • In total, 66% of the AEB's recommendations have been or are being implemented; the remainder have not yet been acted upon. • The data presented above represents mostly audit results given that most of the activities carried out by evaluation in the past year have focused primarily on activities that were not the subject of follow-up studies (e.g. development of Results-based Management and Accountability Frameworks). 	<p><u>Next Steps</u></p> <ul style="list-style-type: none"> • NRCan is revising its performance indicators to reflect its activities and programs more closely, to align better with the new federal audit and evaluation policies, and to improve upon its current performance. • NRCan is also applying for ISO 2000 and National Quality Institute certification, which require more rigorous follow-up of audits, evaluations and other types of studies. Thus, future performance reporting will be based on more extensive performance information, including risk assessment, Results-based Management and Accountability Frameworks development, and other major AEB activities. 								

Compliance in areas of health, safety and the environment within NRCan operations....

Objective: Sustainable development in NRCan operations.

Performance indicator: Progress towards the implementation of environmental health and safety audits and environmental assessment evaluation of NRCan operations.

Target: 100% implementation with action items stemming from findings of audit and evaluations.

<p style="text-align: center;">Number of NRCan EHS Audits and Life Safety Audits Fiscal Years 98/99; 99/00 and 00/01</p> <table border="1"> <thead> <tr> <th>Fiscal Year</th> <th>Environment, Health and Safety Audits</th> <th>Life Safety Audits</th> </tr> </thead> <tbody> <tr> <td>FY 98/99</td> <td>8</td> <td>0</td> </tr> <tr> <td>FY 99/00</td> <td>5</td> <td>27</td> </tr> <tr> <td>FY 00/01</td> <td>0</td> <td>28</td> </tr> </tbody> </table>	Fiscal Year	Environment, Health and Safety Audits	Life Safety Audits	FY 98/99	8	0	FY 99/00	5	27	FY 00/01	0	28	<p><u>NRCan's Contribution</u></p> <ul style="list-style-type: none"> • NRCan is committed to verifying legal compliance in the areas of health and safety and the environment, within its own operations. • Under its Occupational Health and Safety Policy, NRCan is committed to the well-being and safety of its employees and to the maintenance of a safe and healthy workplace. It is the policy of the Department to comply with the <i>Canada Labour Code, Part II</i> and Treasury Board Secretariat policies, standards and procedures. • Under its Departmental Environmental Policy, NRCan is committed to assessing environmental impacts of past, present and future activities and to taking action to avoid, mitigate and remediate environmental impacts arising from such activities. In addition, the policy states that all activities will be carried out in a manner that meets or exceeds federal environmental laws, regulations and policies, and where appropriate, will be compatible with municipal, provincial, national and international standards. • Findings resulting from internal environment, health and safety audits have been addressed using a standard action plan/follow-up approach.
Fiscal Year	Environment, Health and Safety Audits	Life Safety Audits											
FY 98/99	8	0											
FY 99/00	5	27											
FY 00/01	0	28											
<p><u>What Does the Graph Mean?</u></p> <ul style="list-style-type: none"> • The environment, health and safety audits are part of an ongoing departmental program. Areas covered in these audits include atmospheric emissions management; chemical handling, storage and management; hazardous waste disposal and management; water and wastewater management; emergency prevention and response; non-hazardous waste management; OSH management systems; health and safety training; laboratory safety; and materials handling. • The graph indicates that 8 environment, health and safety audits were conducted during the 1998-99 fiscal year, 5 during the 1999-00 fiscal year and 0 in the 2000-01 fiscal year. • This decrease in audit activity was due to a one-time due diligence initiative of life safety audits in the National Capital Region. The life safety audits consumed the Department's capacity to undertake the health and safety audits that it had planned. • The life safety audits identified building and fire code deficiencies such as improperly functioning fume hoods; lack of, or inadequate, fire protection in labs and plant space; asbestos and chemical contamination of work areas; fungus and moulds in science trailers; electrical system overloads; and malfunctioning elevators. • The graph indicates that 53 life safety audits were conducted between fiscal years 1999-00 and 2000-01. 	<p><u>Next Steps</u></p> <ul style="list-style-type: none"> • To address the findings in the life safety audits, building/fire audit work plans were developed and high priority safety and health areas were immediately factored into the project planning and priority ranking process. • In the future, these and other high priority safety and health areas will be permanently incorporated in the Annual Building Management Planning exercise. • The Department will resume a full environment, health and safety auditing program beginning in 2001. 												

Promoting eco-efficiency....

Objective: Sustainable development in NRCan operations.

Performance indicator: Rate of purchasing by NRCan of green power.

Target: 10,000 MWH (megawatt hours) or power purchased per annum.

<p style="text-align: center;">NRCan Purchasing of Green Power</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Megawatt Hours</th> </tr> </thead> <tbody> <tr> <td>1998</td> <td>9,500</td> </tr> <tr> <td>1999</td> <td>10,000</td> </tr> <tr> <td>2000</td> <td>10,000</td> </tr> </tbody> </table>	Year	Megawatt Hours	1998	9,500	1999	10,000	2000	10,000	<p><u>NRCan's Contribution</u></p> <ul style="list-style-type: none"> • NRCan purchases 10,000 MWh of wind-generated electricity annually from ENMAX, Calgary's electricity supplier. This 10-year agreement, which began in 1998, is intended to displace coal-based electricity with electricity from environmentally-friendlier sources for NRCan's facilities in Alberta. • In 1998, 1999 and 2000, NRCan avoided about 27,000 tonnes of greenhouse gas emissions as a result of the green power purchases. • ENMAX ensures that electricity has EcoLogo certification as an environmentally preferable source. • NRCan was joined by Environment Canada in this pilot project and the latter purchases 2,000 MWh of green power annually and avoids about 1,800 tonnes of greenhouse gas emissions.
Year	Megawatt Hours								
1998	9,500								
1999	10,000								
2000	10,000								
<p><u>What Does the Graph Mean?</u></p> <ul style="list-style-type: none"> • In 1998, NRCan negotiated an agreement with ENMAX of Calgary to supply 10, 000 MWh of green power per year to NRCan's Alberta facilities. In 1998, ENMAX supplied 9,500 MWh while in 1999, and 2000, NRCan received the maximum 10,000 MWh. • The lower amount in 1998 was primarily due to the inability of one of the suppliers to provide the full amount requested. 	<p><u>Next Steps</u></p> <ul style="list-style-type: none"> • NRCan has negotiated 10-year agreements on behalf of the Government of Canada for the production of about 50,000 MWh annually of wind-generated electricity for federal facilities in Saskatchewan and Prince Edward Island. • The Government of Canada will begin receiving the electricity in these provinces towards the end of 2001. • Under Action Plan 2000, this initiative was further expanded to replace 20 percent of the Government of Canada's electricity purchases with electricity from emerging renewable sources. Electricity purchased will come from new or expanded generation capacity that has low environmental impact, as certified by a third party. 								

III Sustainable Development Strategy

In December 1997, Natural Resources Canada tabled its first Sustainable Development Strategy (SDS), *Safeguarding our Assets, Securing our Future*, in Parliament.

In developing the strategy, NRCan integrated its policy goals (strategic outcomes) with those of the SDS. Accordingly, key accomplishments found in Section II are aligned to the accomplishments under the SDS. Furthermore, in its 2000-01 Report on Plans and Priorities, NRCan had made a commitment to provide performance information against eleven specific performance indicators in this year's report. This information is presented in a quadrant format on pages 13-14, 24-25, 34-35, 40, 46-49 of this document.

Thirty SDS targets were scheduled for completion in fiscal year 2000-01. The status of each of the targets is explained in detail in a progress report available on the Department's web site at www.nrcan.gc.ca/dmo/susdev.

NRCan's second SDS *Now and for the Future*, tabled in February 2001, builds on the accomplishments of its previous strategy. It is based on an eighteen-month dialogue with stakeholders across the country. The strategy is framed within NRCan's vision for a sustainable future, and contains 30 strategic action commitments to advance sustainable development over the period 2001-04.

IV Financial Performance

Financial Performance Overview

NRCan has re-tooled its financial system by the strategic outcomes shown in Section II of this report. This is the first DPR where textual performance reporting and financial information are aligned.

Definitions

The financial tables in this section present financial information as planned spending, total authorities and actual spending. The definitions of these terms are:

Main Estimates: These dollar figures match those in Part II Main Estimates as approved by Parliament.

Planned Spending: These dollar figures match those shown in NRCan's 2000-01 Report on Plans and Priorities. They represent what the plan was at the beginning of the year, adjusted to include Federal Budget announcements.

Total Authorities: These dollar figures include the main and supplementary estimates for NRCan and match the dollar figures shown in the Public Accounts for 2000-01. They represent what additional spending Parliament has approved for NRCan to reflect changing priorities and unforeseen events.

Actual Spending: These dollar figures match those shown in the Public Accounts for 2000-01 for NRCan. They represent what was actually spent.

1. Summary of Voted Appropriations

Authorities for 2000-2001 - Financial Requirements by Authority (millions of dollars)

Vote	Program	2000-2001 Main Estimates	2000-2001 Planned Spending	2000-2001 Total Authorities	2000-2001 Actuals
1	Operating expenditures	437.7	452.1	487.6	473.8
5	Grants and contributions	97.3	149.7	112.3	101.9
(S)	Minister of Natural Resources - Salary and motor car allowance	-	-	-	-
(S)	Contributions to employee benefit plans	41.5	42.5	46.5	46.5
(S)	Canada-Nova Scotia Development Fund	2.0	2.0	9.7	1.8
(S)	Canada-Newfoundland Development Fund	3.0	3.0	12.3	5.0
(S)	Canada-Newfoundland Offshore Petroleum Board	2.2	2.2	1.4	1.4
(S)	Canada-Nova Scotia Offshore Petroleum Board	1.3	1.3	1.5	1.5
(S)	Payments to the Nova Scotia Offshore Revenue Account	6.0	6.0	9.4	9.4
(S)	Payments to the Newfoundland Offshore Petroleum Resource Revenue Fund	1.2	1.2	6.8	6.8
(S)	Geomatics Canada Revolving Fund	(1.1)	(1.1)	5.3	(1.8)
(S)	Nova Scotia Fiscal Equalization Offset Payment	-	-	0.7	0.7
Total Budgetary		591.1	658.9	693.5	647.0
L15	Loan to Nordion International Inc. for the construction of two nuclear reactors and related processing facilities to be used in the production of medical isotopes	7.8	7.8	7.8	7.8
Total NRCan		598.9	666.7	701.3	654.8

2a. Departmental 2000-01 Main Estimates versus Actual Spending and Total Authorities by Strategic Outcome (millions of dollars) (Budgetary)

Strategic Outcomes	Operating	Capital	Grants & Contributions	Total Gross Expenditures	Less: Respendable Revenues *	Total Net Expenditures
Information dissemination and consensus building						
Main Estimates	146.2	1.8	15.8	163.8	(11.3)	152.5
<i>Total authorities</i>	197.9	4.5	16.9	219.3	(13.8)	205.5
Actuals	192.9	4.5	14.6	212.0	(13.8)	198.2
Economic and social benefits						
Main Estimates	129.0	1.1	52.0	182.1	(14.3)	167.8
<i>Total authorities</i>	115.9	2.9	98.6	217.4	(10.5)	206.9
Actuals	112.0	2.9	75.7	190.6	(10.5)	180.1
Environmental protection and mitigation						
Main Estimates	163.3	1.0	41.4	205.7	(9.1)	196.6
<i>Total authorities</i>	146.7	2.7	34.5	183.9	(4.1)	179.8
Actuals	141.7	2.7	34.1	178.5	(4.1)	174.4
Safety and security of Canadians						
Main Estimates	35.1	0.4	3.8	39.3	(4.8)	34.5
<i>Total authorities</i>	34.1	1.9	3.7	39.7	(9.0)	30.7
Actuals	31.5	1.0	3.6	36.1	(7.7)	28.4
Sound departmental management						
Main Estimates	39.7	0.1	-	39.8	(0.1)	39.7
<i>Total authorities</i>	70.2	0.2	0.4	70.8	(0.2)	70.6
Actuals	65.5	0.2	0.4	66.1	(0.2)	65.9
Total						
Main Estimates	513.3	4.4	113.0	630.7	(39.6)	591.1
<i>Total authorities</i>	564.4	12.2	154.1	731.1	(37.6)	693.5
Actuals	543.6	11.3	128.4	683.3	(36.3)	647.0
Other Revenues and Expenditures						
Less: Non-Respendable Revenues **						
Main Estimates						(12.1)
<i>Total authorities</i>						(32.2)
Actuals						(32.2)
Add: Cost of services provided by other departments						
Main Estimates						22.5
<i>Total authorities</i>						59.4
Actuals						59.4
Net Cost of the Program						
Main Estimates						601.5
<i>Total authorities</i>						720.7
Actuals						674.2

* Formerly "Revenues Credited to the Vote"

** Formerly "Revenues Credited to the CRF"

**2b. Summary of 2000-01 Main Estimates versus Actual Spending and Total Authorities
(millions of dollars) (Budgetary)**

	2000-2001 Main Estimates	2000-2001 Total Authorities	2000-2001 Actuals
Operating	513.3	564.8	543.6
Capital	4.4	12.2	11.3
Grants & Contributions	113.0	154.1	128.4
Total Gross Expenditures	630.7	731.1	683.3
Less:			
Respendable Revenues	(39.6)	(37.6)	(36.3)
Total Net Expenditures	591.1	693.5	647.0
Other Revenues and Expenditures			
Non-respendable Revenues	(12.1)	(32.2)	(32.2)
Cost of services provided by other departments	22.5	59.4	59.4
Net Cost of the Program	601.5	720.7	674.2

**3. Historical Comparison of Total Net Planned Spending to Net Actual Spending and Total Authorities by Strategic Outcome*
Departmental Planned versus Actual Spending and Total Authorities (millions of dollars)
(Budgetary)**

Strategic Outcomes	2000-01 Main Estimates	2000-01 Planned Spending	2000-01 Total Authorities	2000-01 Actuals
Information dissemination and consensus building	152.5	152.5	205.5	198.2
Economic and social benefits	167.8	173.1	206.9	180.1
Environmental protection and mitigation	196.6	257.9	179.8	174.4
Safety and security of Canadians	34.5	35.5	30.7	28.4
Sound departmental management	39.7	47.7	70.6	65.9
Total Budgetary	591.1	666.7	693.5	647.0

* NRCan recently completed the shift in its reporting structure from business lines to the strategic outcomes shown in this table. Accordingly, historical comparisons are not available for fiscal years 1998-99 and 1999-00.

4. Responsible Revenues by Strategic Outcome* (millions of dollars)

Strategic Outcomes	2000-01 Planned Revenues	2000-01 Total Authorities	2000-01 Actuals
Information dissemination and consensus building	2.6	13.8	13.8
Economic and social benefits	9.6	10.5	10.5
Environmental protection and mitigation	7.8	4.1	4.1
Safety and security of Canadians	2.2	9.0	7.7
Sound departmental management	0.1	0.2	0.2
Total Responsible Revenues	22.3	37.6	36.3

* NRCan recently completed the shift in its reporting structure from business lines to the strategic outcomes shown in this table. Accordingly, historical comparisons are not available for fiscal years 1998-99 and 1999-00.

5. Non-Responsible Revenues by Strategic Outcome* (millions of dollars)

Strategic Outcomes	2000-01 Planned Revenues	2000-01 Total Authorities	2000-01 Actuals
Information dissemination and consensus building	0.2	2.2	2.2
Economic and social benefits	10.0	25.6	25.6
Environmental protection and mitigation	0.1	1.0	1.0
Safety and security of Canadians	1.8	1.5	1.5
Sound departmental management	-	1.9	1.9
Total Non-Responsible Revenues	12.1	32.2	32.2

The variance between planned revenues and actuals are attributed to: refund of previous year's expenditures, adjustments to previous years payables, interest on overdue accounts, intellectual property and the revolving fund payment of overhead costs.

* NRCan recently completed the shift in its reporting structure from business lines to the strategic outcomes shown in this table. Accordingly, historical comparisons are not available for fiscal years 1998-99 and 1999-00.

6. Total Statutory Payments by Strategic Outcome (millions of dollars)

Strategic Outcomes	1998-99 Actuals	1999-00 Actuals	2000-01 Main Estimates	2000-01 Planned Spending	2000-01 Total Authorities	2000-01 Actuals
Information dissemination and consensus building	-	-	-	-	-	-
Economic and social benefits	7.8	9.1	12.2	12.2	38.8	23.6
Environmental protection and mitigation	-	-	-	-	-	-
Safety and security of Canadians	1.9	2.4	3.5	3.5	2.9	2.9
Sound departmental management	-	-	-	-	-	-
Total Statutory Payments	9.7	11.5	15.7	15.7	41.7	26.5

7. Total Transfer Payments by Strategic Outcome* (millions of dollars)

Strategic Outcomes	2000-01 Main Estimates	2000-01 Planned Spending	2000-01 Total Authorities	2000-01 Actuals
GRANTS				
Information dissemination and consensus building	0.2	0.2	0.3	0.3
Economic and social benefits	0.2	0.2	30.1	30.1
Environmental protection and mitigation	0.1	-	-	-
Safety and security of Canadians	-	-	-	-
Sound departmental management	0.1	0.1	0.1	0.1
Total Grants	0.6	0.5	30.5	30.5
CONTRIBUTIONS				
Information dissemination and consensus building	15.6	15.7	16.6	14.3
Economic and social benefits	39.6	51.8	29.7	22.0
Environmental protection and mitigation	41.3	41.3	34.4	34.1
Safety and security of Canadians	0.2	3.7	0.7	0.7
Sound departmental management	-	-	0.4	0.3
Total Contributions	96.7	112.5	81.8	71.4
Total Transfer Payments	97.3	113.0	112.3	101.9

Excludes Statutory Transfer Payments

* NRCan recently completed the shift in its reporting structure from business lines to the strategic outcomes shown in this table. Accordingly, historical comparisons are not available for fiscal years 1998-99 and 1999-00.

8. Transfer Payments which exceeded \$5 million/year in 2000-01

Information Dissemination and Consensus Building

Objectives: (i) easily accessible and integrated knowledge on the state of Canada's landmass and natural resources, and the economic, environmental, and social dimensions of their use; (ii) greater national and international cooperation and consensus on sustainable development issues, policies, goals and actions; and (iii) fiscal, regulatory and voluntary approaches that encourage the sustainable development of natural resources.

Transfer Payment	Key Accomplishments
Model Forest Program (\$7.4 million)	Many Canadian communities depend on the forest environment for their social, cultural, and economic well-being. Canada's Model Forest Program is widely recognized for developing ongoing effective approaches to sustainable forest management. More information on accomplishments under this program can be found on page 8.

Economic and Social Benefits

Objectives: (i) greater economic opportunities and encouraging investment in innovative and higher-value uses of natural resources; (ii) expanded access to international markets for Canadian resource-based products, knowledge, technologies and services; and (iii) increased capacity of Aboriginal, rural and northern communities to generate sustainable economic activity based on natural resources.

Transfer Payment	Key Accomplishments
Nova Scotia Revenue Account (\$9.4 million)	Pursuant to the revenue sharing provisions of the <i>Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act</i> , NRCan pays the Province of Nova Scotia monies equivalent to the federal offshore resource revenue as they are collected. These payments are made with respect to royalties, forfeitures, offshore taxes and miscellaneous fees.
Canada-Newfoundland Development Fund (\$5 million)	Assists the Province of Newfoundland in creating the infrastructure for oil and gas development off the coast of Newfoundland and Labrador. The Marine Institute training centre provides special facilities to train workers in offshore safety and survival techniques. The facility is also the base for Memorial University of Newfoundland's training and research vessels. The training centre ensures that all workers on offshore oil rigs are fully equipped to deal with potential hazards, addresses the training needs of industry, strengthens the growing petroleum and marine sectors, and makes Newfoundland more internationally competitive.
Newfoundland Offshore Petroleum Resource Revenue Fund (\$6.8 million)	Pursuant to the revenue sharing provisions of the <i>Canada-Newfoundland Atlantic Accord Implementation Act</i> , NRCan pays the Province of Newfoundland monies equivalent to the federal offshore revenue as they are collected. These payments are made with respect to royalties, forfeitures, offshore taxes and miscellaneous fees.
Hibernia Interest Assistance (\$5.4 million)	In September 1990, the federal government and the Hibernia owners entered into legal agreements whereby the government granted concessions to the owners in order to develop an offshore oil industry in Canada. In return, the owners agreed to meet employment and industrial benefit targets.

Environmental Protection and Mitigation

Objectives: (i) Canada addressing its international Kyoto commitment to reduce greenhouse gases; (ii) scientific research, technologies and stewardship practices that reduce environmental impacts, conserve biodiversity, and increase the efficiency of resource development and use; and (iii) Canada's environment safeguarded from the risks associated with natural resource development and use.

Transfer Payment	Key Accomplishments
Port Hope clean-up (\$30 million)	Information for this accomplishment can be found on page 37.
Climate Change Action Fund (\$17.4 million)	Address Canada's Kyoto commitments to reduce greenhouse gas emissions to six percent below 1990 levels by the period 2008-12 (see page 27).
Energy efficiency and alternative energy (\$8.2 million)	Improve energy efficiency and the adoption of alternative sources of energy which contributes to reducing greenhouse gas emissions (see pages 28-30).

9. Loans, Investments and Advances (millions of dollars)

	Opening April 1 st 1999	Opening April 1 st 2000	New loans issued	Repayments 2000-01	Outstanding Balance 2000-01
Loans					
Atomic Energy of Canada Ltd.					
Housing	0.2	0.1	-	-	0.1
Heavy Water Inventory	9.5	8.5	-	1.0	7.5
Loans to facilitate the implementation of the Hibernia Development Project	132.0	82.8	-	9.2	73.6
Nordion International Inc.	52.8	92.2	7.8	2.0	98.0
Total Loans	194.5	183.6	7.8	12.2	179.2
Investments and Advances					
Sunset / Special Programs					
Lower Churchill Development Corporation	14.8	14.8	-	-	14.8
Atomic Energy of Canada Ltd.	164.2	164.2	-	-	164.2
DEVCO Working Capital Advance	12.3	-	36.4	26.4	10.0
Total Investments and Advances	191.3	179.0	36.4	26.4	189.0
Total	385.8	362.6	44.2	38.6	368.2

10. Geomatics Canada Revolving Fund Financial Summary

(thousands of dollars)	1998-99 Actuals	1999-00 Actuals	2000-01 Planned Spending	2000-01 Total Authorities	2000-01 Actuals
Revenues					
Products	9,845	10,264	13,200	13,200	10,839
Services	4,433	5,290	3,800	3,800	3,291
Consulting	1,373	537	1,600	1,600	255
Total revenues	15,651	16,091	18,600	18,600	14,385
Expenditures	15,818	16,710	17,900	17,900	14,423
Profit (Loss)	(167)	(619)	700	700	(38)
Changes in Working Capital	(742)	380	200	200	770
Capital acquisitions	(517)	(891)	(100)	(100)	(285)
Other items	447	536	300	300	609
Cash requirements	(979)	(594)	1,100	1,100	1,056
Cash at April 1 st	(447)	(1,426)	(800)	(800)	(2,020)
Cash at March 31	(1,426)	(2,020)	300	300	(964)
Year end adjustments	(237)	(698)			96
Cumulative Net Authority Used	(1,663)	(2,718)	300	300	(868)

11. Contingent Liabilities (millions of dollars)

List of Contingent Liabilities	Amount of Contingent Liability		Current as of March 31 st , 2001
	March 31 st 1999	March 31 st 2000	
Claims and Pending and Threatened Litigation	22.4	26.7	954.2
Total Contingent Liabilities	22.4	26.7	954.2

Annexes

A. External Recognition

“The most important natural resources that we deal with daily are our people.... I say very proudly, some of the most brilliant minds in the government work right here, and just as we need to have the sustainable development of our natural resources, we also need the sustainable development of our human resources.....”

Ralph Goodale (NRCan Senior Managers’ Conference, May 2001)

NRCan is pleased to report that the following NRCan employees and teams have received government-wide and external recognition for their extraordinary work.

The Head of the Public Service Award

Jill Lang Ward - Revitalizing the Public Service of Canada (PSC) is a top priority for public servants from coast to coast to coast. The challenges of supporting career development, creating a workplace of choice and building an organization committed to continuous learning are even greater when working on behalf of employees who are geographically dispersed in an area as vast as Northern Ontario or the Algoma District. Jill Lang Ward’s abilities to build a network and mobilize people have made her a powerful agent for change in this part of the country.

Her accomplishments include her contributions to NRCan’s Ontario Federal Council Secretariat, organizing the Great Lakes Forestry Centre Wellness Fair, establishing the Algoma District Joint Career Transition Committee and developing Middle Managers Connect, a newsletter to link middle managers in Ontario. Ms. Lang also acted as a mentor to a number of employees of the PSC.



Dr. Peter. Harrison, Jill Lang Ward, Mel Cappe

Ric Cameron for his participation in the Public Service Employee Survey Project Team - The first-ever Public Service Employee Survey was designed to obtain views of federal employees on their workplaces, and to identify how those workplaces can be made more supportive of employees’ well-being, diversity, career aspirations, and their learning and professional development needs. The team surveyed all 190,000 employees of the Public Service who are spread over 70 departments and agencies, in all regions of Canada and in missions around the world. The team achieved a 55 percent response rate from a fully representative sample of employees.

Climate Change Technology Early Action Measures (TEAM)

Reducing greenhouse gas (GHG) emissions by six percent from 1990 levels between the period 2008 and 2012 is a daunting task, especially given our energy-intensive economy. But the members of the TEAM are already making major strides toward that goal. The application of technology from current TEAM projects has the potential to reduce GHG emissions by an estimated 50 megatonnes over the next ten years – a significant contribution to meeting Canada’s commitment under the Kyoto Protocol.



M. Aubé, A. Dolenko, Dr. P. Harrison, M. Cappe, W. Richardson, E. Burk, L. Palombo, D. Hajesz, A. Kosteltz

Order of Canada

Steve Michael Blasco - Mr. Blasco played a pivotal role in promoting the transfer of technology from government and university researchers to the exploration industry. A renowned marine geophysicist, he designed innovative equipment for the harvesting of ocean resources. Relating his experience as a member of the production team for the IMAX film *Titanica*, he uses his excellent communication skills to educate Canadians and share with them his passion for science.

Herbert W. Beall - During his distinguished career, he was one of the first to study the behavior and nature of forest fires. He pioneered the development of a system of predicting fire danger by linking weather conditions and forest combustibility. His innovative research laid the foundation for Canada's internationally recognized forest fire danger rating system. A mentor to young scientists, he was also instrumental in the creation of the International Centre for Research in Agroforestry in Nairobi, Kenya.

Canada Award for Excellence from the National Quality Institute

NRCan's **Aeronautical and Technical Service (ATS)** was the first federal public service organization in Canada to win this award. The ATS team is among the best in the world at creating aeronautical charts, and their commitment to providing the highest quality products is second to none. Their maps and charts are crucial to the safety and security of Canadians: pilots use them to navigate, air traffic controllers need them to manage heavy air traffic, and rescue teams rely on them to find their way quickly to emergencies. The Department takes pride in this ATS achievement in serving Canadians.



C. Goyette, D. Leat, L. Tardif, N. Grant, S. Eyamie, P. LaRose, D. Goulet, D. Nontell

Médaille d'honneur 2000, Ordre des ingénieurs forestiers du Québec

Dr. Yvan Hardy received this award for his exceptional lifetime contributions to the profession of forestry engineering.

Royal Society of Canada

Dr. Joseph Cihlar was elected to the Royal Society of Canada. Election to Fellowship in the society is the highest accolade available to scientists and scholars in Canada. Dr. Cihlar is recognized worldwide for his leadership in using satellite data and models to monitor the earth's surface.

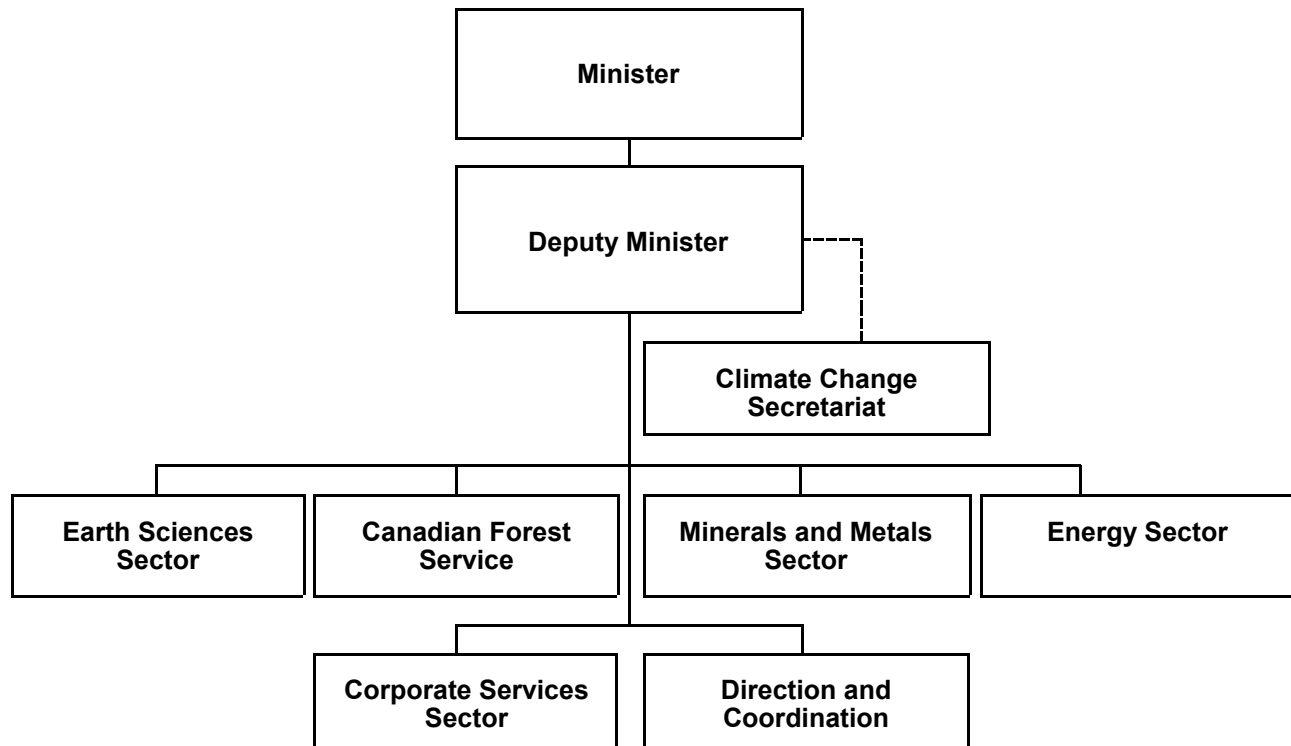
Canadian Mining Hall of Fame

James Harrison was inducted into the Canadian Mining Hall of Fame for his outstanding contributions to the Canadian mining industry.

A Day in the Life of the Public Service of Canada

NRCan is also very proud to have had some of its employees profiled in the June 2000 edition of this great brochure put together by The Leadership Network. The brochure and profiles are available at <http://www.leadership.gc.ca>.

B. Organization Chart



The **Earth Sciences Sector** promotes the sustainable development of Canada's natural resources by providing comprehensive science and technology related to geoscience and geomatics knowledge. This knowledge supports public sector activities in Canada, investment decisions, and operations by the Canadian private sector at home and overseas. It extends logistics support to Arctic science through the Polar Continental Shelf Project. Geomatics Canada provides geographical information, topographic maps and aeronautical charts, legal surveys of Canada Lands, geodesy for accurate positioning, and the archive and application of earth observation data. Through the Geological Survey of Canada, the Sector provides the framework for mineral and petroleum exploration, helps Canadians mitigate the impact of hazards such as earthquakes and toxic substances in the environment, and contributes to climate change science, impacts and adaptation. Policy analysis, development and coordination is provided to support the sector's mandate.

The **Canadian Forest Service** promotes the sustainable development of Canada's forests and the competitiveness of the Canadian forest sector for the well-being of present and future generations of Canadians. As the premier forestry S&T research and national policy coordination agency in Canada, the Canadian Forest Service plays a pivotal role in building a consensus on key forest issues, shaping national and international forest agendas, and generating and transferring knowledge through its world-class forestry research. Its policy development and S&T research programs are delivered through a headquarters establishment and five national science research networks operating out of five forestry research centres located across Canada.

The **Minerals and Metals Sector** promotes the sustainable development of Canada's minerals and

metals resource industries by integrating economic, social and environmental objectives. It provides policy advice, S&T, and commodity and statistical information to support decision-making. It is also the federal government's primary source of expertise on explosives regulations and technology. The sector promotes globally the safe use of minerals and metals, as well as the application of sound science to decisions involving minerals and metals, and facilitates the development of domestic and international partnerships to address important challenges concerning the responsible development and use of minerals, metals and their products.

The **Energy Sector** fosters the sustainable development and responsible use of Canada's energy resources to meet the present and future needs of Canadians. It focuses on S&T, policies, programs, knowledge and international activities in the areas of energy efficiency, renewable energy, alternative transportation fuels, and conventional energy to further sustainable development. Through its work, the sector helps address the climate change challenge, promotes better environmental and consumer choices, facilitates North American and international trade in energy, contributes to technical innovation, job creation and economic growth, facilitates environmental protection and increased public safety and security, and helps to ensure competitively priced, reliable and secure energy supplies for Canadians.

The **Corporate Services Sector** provides centres of expertise and supporting infrastructure in the areas of financial management, human resources management, information management, access to information and privacy, information technology and real property management. The sector also assists the Department in meeting its due diligence requirements in the areas of environment, health, safety and security.

Direction and Coordination provides services to the Department's Executive Offices through the following branches. The **Strategic Planning and Coordination Branch** provides strategic policy leadership, expertise, and advice for departmental and portfolio priorities, horizontal policy/science issues and initiatives, and sustainable development in Canada and internationally. The **Audit and Evaluation Branch** provides senior management with independent professional advice and assurances on the performance of management frameworks, departmental programs, policies and operations, and on risk management. The **Communications Branch** leads departmental communications in support of the Minister, government priorities and the natural resources sector; it provides advice for internal and external audiences. **Legal Services** provides day-to-day legal advice and guidance to ensure that NRCan's activities, policies and operations are consistent with the law, regulations and with high ethical standards.

The **Climate Change Secretariat**, in cooperation with the provinces and territories, coordinates the development of the National Implementation Strategy on Climate Change, acts as a focal point for coordinating the federal government's domestic policy and programming on climate change, and manages the Climate Change Action Fund. The Secretariat reports to the Deputy Ministers of NRCan and Environment Canada.

C. Contacts for further information, Internet Addresses and Statutory Annual Reports

Natural Resources Canada

Headquarters Library
Public Enquiries
Main Floor, 580 Booth Street
Ottawa, ON, K1A 0E4
Telephone:(613) 995-0947
Fax: (613) 992-7211
E-mail:questions@NRCan.gc.ca

Statutory Annual Reports:

1. **The State of Canada's Forests**
<http://www.nrcan.gc.ca/cfs/proj/ppiab/sof/>
2. **State of Energy Efficiency in Canada**
<http://oee.nrcan.gc.ca/seec/exec.summ.htm>

Headquarters and Sector Internet Sites:

Natural Resources Canada Home Page	http://www.nrcan.gc.ca
Canadian Forest Service	http://www.nrcan.gc.ca/cfs
Climate Change – Government of Canada	http://climatechange.gc.ca/
Climate Change – NRCan	http://www.climatechange.nrcan.gc.ca/
Climate Change Secretariat	http://climatechange.gc.ca/english/html/feature/feature.html
Corporate Services Sector	http://www.nrcan.gc.ca/css/css-pe.html
Earth Sciences Sector	http://www.nrcan.gc.ca/ess
Energy Sector	http://www.nrcan.gc.ca/es
Minerals and Metals Sector	http://www.nrcan.gc.ca/mms
<i>ResSources</i>	http://www.nrcan.gc.ca/ressources
S&T at NRcan	http://www.nrcan.gc.ca/dmo/scitech
Statutes and Regulations	http://www.nrcan.gc.ca/dmo/spcb/regiss_e.html
Sustainable Development	http://www.nrcan.gc.ca/dmo/susdev

Canadian Forest Service Internet Sites:

CFS Atlantic Forestry Centre	http://www.fcmr.forestry.ca
CFS Great Lakes Forestry Centre	http://www.glfc.forestry.ca
CFS Laurentian Forestry Centre	http://www.cfl.forestry.ca
CFS Northern Forestry Centre	http://www.nofc.forestry.ca
CFS Pacific Forestry Centre	http://www.pfc.cfs.nrcan.gc.ca
Costa Rica-Canada Initiative	http://www.nrcan.gc.ca/cfs/crc/
Criteria and Indicators (C&I)	http://www.NRCan.gc.ca:80/cfs/proj/ppiab/ci/
First Nation Forestry Program	http://www.fnfp.gc.ca/
Model Forest Network	http://mf.ncr.forestry.ca/
Montreal Process C&I	http://www.mpci.org/
National Forest Strategy	http://www.nrcan.gc.ca/cfs/nfs/strateg/control_e.html
United Nations Framework Convention on Climate Change	http://www.unfccc.de/

Earth Sciences Sector Internet Sites:

Aeronautical and Technical Services	http://aero.nrcan.gc.ca
Canada Centre for Remote Sensing	http://www.ccrs.nrcan.gc.ca
Canadian Earth Observation Network	http://ceonet.cgdi.gc.ca
Canadian Geoscience Publications Directory	http://ntserv.gis.nrcan.gc.ca

Earth Sciences Sector (continued)

Canadian National Earthquake Hazards Program	http://www.seismo.nrcan.gc.ca
Canadian National Geomagnetism Program	http://www.geolab.nrcan.gc.ca/geomag
Centre for Topographic Information	http://maps.nrcan.gc.ca
Centre for Topographic Information-Sherbrooke	http://www.ccg.nrcan.gc.ca
Earth Sciences Information Centre	http://www.nrcan.gc.ca/ess/esic
GeoConnections	http://www.geoconnections.org
Geodetic Survey	http://www.geod.nrcan.gc.ca
Geological Survey of Canada	http://www.nrcan.gc.ca/gsc
Geomatics Canada	http://www.geocan.nrcan.gc.ca
Legal Surveys Division	http://www.geocan.nrcan.gc.ca/lsd
National Air Photo Library	http://airphotos.nrcan.gc.ca
National Atlas of Canada	http://www-nais.ccrs.nrcan.gc.ca
National Geoscience Mapping Program (NATMAP)	http://ntserv.gis.nrcan.gc.ca/natmap
Polar Continental Shelf Project	http://polar.nrcan.gc.ca
<i>ResSources</i> GSC	http://rgsc.nrcan.gc.ca

Energy Sector Internet Sites:

AutoSmart and EnerGuide for Vehicles	http://autosmart.NRCan.gc.ca/online_E.htm
CANMET Energy Diversification Research Laboratory	http://cedrl.mets.nrcan.gc.ca/
CANMET Energy Technology Branch	http://www.nrcan.gc.ca/es/etb
CANMET Energy Technology Centre	http://nrcan.gc.ca/es/etb/cetc/cetchome.htm
CANMET Information Centre	http://www.nrcan.gc.ca/es/msd/cic/ecichome.htm
CANMET Western Research Centre	http://www.nrcan.gc.ca/es/etb/cwrc/wrcehome.html
EnerGuide for Houses	http://energuide.nrcan.gc.ca/houses/
Energy Policy Branch	http://www.nrcan.gc.ca/es/new/enquir2.htm
Energy Resources Branch	http://www.nrcan.gc.ca/es/erb/erb/index.html
Energy Technology Data Exchange	http://nrcan.gc.ca/es/msd/cic/cdnetde.htm
Energy Technology Futures	http://www.nrcan.gc.ca/es/etf
National Energy Use Database	http://oe.nrcan.gc.ca/neud/
Nuclear energy, uranium and radioactive waste	http://nuclear.nrcan.gc.ca
Office of Energy Efficiency	http://www.oe.nrcan.gc.ca
Office of Energy Research and Development	http://www.nrcan.gc.ca/es/oerd/
Renewable Energy Deployment Initiative	http://www.nrcan.gc.ca/es/erb/reed/redi_e.htm
RETScreen™	http://cedrl.mets.nrcan.gc.ca/e/index_e.html

Minerals and Metals Sector Internet Sites:

Applied Mineralogy	http://www.nrcan.gc.ca/mms/canmet-mtb/mineralogy
Aquatic Effects Program	http://www.nrcan.gc.ca/mets/aete/
Annual Conference of the Mines Ministries of the Americas (CAMMA)	http://www.camma.org
Biominet	http://www.nrcan.gc.ca/mets/biominet/
Business Climate for Mineral Investment	http://mmsdl.mms.nrcan.gc.ca/business
Canadian Explosives Research Laboratory	http://www.nrcan.gc.ca/mms/explosif/cerldireng.htm

Minerals and Metals Sector (continued)

Canadian Certified Reference Materials Project (CCRMP)	http://www.nrcan.gc.ca/mets/ccrmp
Canadian Lightweight Materials Research Initiative (CLiMRI)	http://climri.nrcan.gc.ca
Canadian Minerals Yearbook	http://www.nrcan.gc.ca/mms/cmym/index_e.html
Canadian Mining Technology Network (CMT-Net)	http://cmt-net.nrcan.gc.ca
CANMET Environment Laboratory	http://envirolab.nrcan.gc.ca
CANMET Experimental Mine (Val-d'Or)	http://www.nrcan.gc.ca/mms/canmet-mtb/valdor
CANMET Materials Technology Laboratory	http://www.nrcan.gc.ca/mms/canmet-mtb/mtl
CANMET Mineral Technology Branch	http://www.nrcan.gc.ca/mms/canmet-mtb
CANMET Mining and Mineral Sciences Laboratories	http://www.nrcan.gc.ca/mms/canmet-mtb/mmsl.htm
Certifying Agency for Nondestructive Testing	http://ndt.nrcan.gc.ca
Economic and Financial Analysis Branch	http://www.nrcan.gc.ca/mms/efab/
Explonet	http://www.nrcan.gc.ca/explonet
Explosives Regulatory Division	http://www.nrcan.gc.ca/mms/explosif/
Ground Control	http://www.nrcan.gc.ca/mms/canmet-mtb/bells/encorpge.htm
Inventory of Mining Industry Practices to Conserve Wildlife and Habitat in Canada	http://mmsd1.mms.nrcan.gc.ca/business/inventory/
MEND 2000	http://mend2000.nrcan.gc.ca
Mines Minister's Conference	http://www.nrcan.gc.ca/mms/mmc/index-e.htm
Minerals and Metals – A World to Discover	http://www.nrcan.gc.ca/mms/school/e_mine.htm
Minerals and Metals Fact Sheets and Information Bulletins	http://www.nrcan.gc.ca/mms/bulletin-e.htm
Minerals and Mining Statistics Division	http://www.nrcan.gc.ca/mms/efab/mmsd/
Mineral Industry Info-Guide	http://www.nrcan.gc.ca/mms/pubs/infoguide-e.pdf
Mining and Mapping MMS Knowledge	http://mmsd1.mms.nrcan.gc.ca/maps/
Mining Taxation World	http://www.nrcan.gc.ca/ms/efab/tmrd/
Recycling Technology Newsletter (R-Net)	http://RNET.nrcan.gc.ca

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