ESTIMATES

Natural Resources Canada

Performance Report

For the period ending
March 31, 2000

Canada

Improved Reporting to Parliament
Pilot Document

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.*

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Foreword

On April 24, 1997, the House of Commons passed a motion dividing on a pilot basis the *Part III of the Estimates* document for each department or agency into two separate documents: a *Report on Plans and Priorities* tabled in the spring and a *Departmental Performance Report* tabled in the fall.

This initiative is intended to fulfil the government's commitments to improve the expenditure management information provided to Parliament. This involves sharpening the focus on results, increasing the transparency of information and modernizing its preparation.

The Fall Performance Package is comprised of 83 Departmental Performance Reports and the President's annual report, *Managing for Results 2000*.

This ***Departmental Performance Report,*** covering the period ending March 31, 2000 provides a focus on results-based accountability by reporting on accomplishments achieved against the performance expectations and results commitments as set out in the department's *Report on Plans and Priorities* for 1999-00 tabled in Parliament in the spring of 1999.

Results-based management emphasizes specifying expected program results, developing meaningful indicators to demonstrate performance, perfecting the capacity to generate information and reporting on achievements in a balanced manner. Accounting and managing for results involve sustained work across government.

The government continues to refine its management systems and performance framework. The refinement comes from acquired experience as users make their information needs more precisely known. The performance reports and their use will continue to be monitored to make sure that they respond to Parliament's ongoing and evolving needs.

This report is accessible electronically from the Treasury Board Secretariat Internet site: http://www.tbs-sct.gc.ca/rma/dpr/dpre.asp

Comments or questions can be directed to the TBS Internet site or to:

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Natural Resources Canada

Performance Report

For the period ending
March 31, 2000

Ralph Goodale
Minister of Natural Resources Canada

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I Minister's Executive Summary

Ralph Goodale
Minister of
Natural Resources Canada

I am pleased to present the 1999-2000 Performance Report for Natural Resources Canada (NRCan).

At the heart of NRCan, central to our mandate and our vision, is sustainable development – the integration of environmental, economic, and social considerations in the development and use of our natural resources. Intimately connected with our quality of life and standard of living, sustainable development underlies nearly all of NRCan's work, from geological research to innovations in remote sensing, from forest management to climate change technology. As you will see in this document, we have gone a long way towards creating the conditions for the sustainable growth of Canada's natural resources industries. But with global competition getting tougher every day, we cannot afford to take what we have done as the measure of what we need to do. Much effort will be required to secure the advantages we are after, and much more will be required to retain them.

A Vision for Canada's Natural Resources Sector

As we enter the new millennium, Canada must become 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.

In the 21st century, the natural resources sector faces an array of challenges: economic and financial, technological and scientific, environmental and social, even aesthetic and cultural. NRCan is working to help the industry turn these challenges into opportunities – opportunities that can be exploited to improve the Canadian quality of life and standard of living throughout the country. In keeping with the priorities that the Government of Canada stated in the 1999 *Speech from the Throne* and confirmed in the federal budget of 2000, we are working to help Canada to develop a dynamic economy, a healthier environment, stronger communities and an enhanced place in the world.

Assessing our Progress

This report outlines NRCan's progress against its 1999-2000 commitments. By using the Department's Performance Measurement Framework, NRCan is able to inform stakeholders of the progress made toward advancing departmental goals related to sustainable development and good governance.

Listed below are our five departmental goals, together with highlights of our 1999-2000 accomplishments.

1. Information to make balanced decisions regarding natural resources

To make balanced decisions about natural resources, we need accurate information, agreement on desired results, and fiscal, regulatory and voluntary measures strong enough to carry our findings into effect. In 1999-2000, NRCan continued to accumulate knowledge about Canada's natural resources and to put this knowledge to use through further development of world-class programs, policy and scientific research. For example, the launching of GeoConnections in August 1999 – a five-year $60 million national partnership initiative – will help Canadians have better access to more computerized geospatial data through the Internet. The goal is to help Canadians locate practically anything in the country with a couple of clicks. Emergency workers will be able to pinpoint phone and power lines, overall response time for 911 calls will be decreased, Canadian school children will be able to discover more about their country, and governments will be more able to protect the environment and manage Canada's natural resources (www.geoconnections.org).

2. Sustainable economic and social benefits derived from natural resources for present and future generations

The natural resources sector is absolutely vital to our economy and to our society, providing sustainable economic and social benefits to all Canadians, including high-quality jobs in every region of Canada. Recent work has revealed that, based on total factor productivity, five of Canada's top ten industries were found in the natural resources sector. The significance of this finding hits home when we consider that productivity (the value of what is produced per unit of input) is the most important determinant of our standard of living. At present, our natural resource industries appear poised to continue contributing heavily toward that goal; however, we will need greater investments and innovative uses of natural resources, expanded access to international markets, and increased sustainable economic activity in resource-based communities.

3. Strategies to manage the environmental impacts of natural resources development and use

One of NRCan's goals is to help Canadians manage the environmental impacts of natural resource development and use. To achieve this goal, we are focusing on addressing climate change, developing sustainable development technologies, and adopting practices that safeguard the environment. Last year, NRCan compared its climate change performance in carbon efficiency (i.e., the ratio of greenhouse gas emissions to economic output) with that of five other OECD industrialized countries. The results showed that Canada compares favorably with similar economies in greenhouse gas emission reductions, but that continued progress will require further lowering of carbon intensity in each of the three major areas of energy use: buildings, transportation and industry. All three areas saw encouraging progress last year and further efforts are being devised to ensure this trend continues (http://www.climatechange.nrcan.gc.ca).

4. Safety and security in the natural resources sector

In 1999-2000, the Department helped improve the safety and security of Canadians in several areas, including natural hazards, geographical orientation, and explosives. It is instructive to consider the enormous scale on which much of NRCan's safety and security activities take place, and our work in forestry provides one of the best examples how close vigilance can be maintained over vast distances. Every year, fires claim roughly as much forested land as Canada harvests, resulting in losses of over $1 billion in tourism, human habitat, timber and wildlife. By way of minimizing this loss, NRCan helped to develop and administer Canada's fire management information systems. These include the Canadian Forest Fire Danger Rating System, which rates the potential for forest fires and predicts their behavior; and our national fire danger maps, which have been adapted for use in Florida, Mexico, Alaska, New Zealand, and the Association of South East Asian Nations (http://www.nofc.forestry.ca/fire/frn/index.htm).

5. A department that is efficiently and effectively managed

Finally, in line with the Government's commitment to good governance, NRCan took decisive steps to improve its management practices, human resources, and facilities. We are working harder than ever to reduce waste and to use energy more efficiently. We are paying close attention to the needs of our employees, and will make extensive use of the Public Service Employee Survey, the results of which were released in late 1999. We are also cooperating with other science and technology (S&T) departments on one of my top priorities: making sure that the federal government's science and technology capacity is equal to its needs, now and in the future.

Conclusion

I believe that NRCan has accomplished a great deal over the past year or so. It is worth remembering, however, that the value of these accomplishments can be understood only in light of the value of Canada's resource sector. It forms part of every Canadian's heritage, and it is clear that it will hold a firm place in the future of the country. Last year, the resource industries accounted for over one-tenth of our GDP, a fifth of all new capital investment, a third of all exports, and three-quarters of a million direct jobs. It is because of the vital nature of these Canadian industries – the muscle and blood of our economy – that NRCan must continue to seek out the science and technologies, the policies and incentives that will maintain their health and increase their worth in the 21st century.

In the coming year, NRCan will work with its stakeholders to meet the challenges at hand and to make the most of our opportunities to become a world leader in sustainable development and an integral part of the new knowledge-based, technology-driven global economy.

II Departmental Performance

NRCan's Mission

Natural Resources Canada provides the knowledge and expertise for the sustainable development and use of Canada's natural resources and the global competitiveness of the resource and related sectors for the well-being of present and future generations.

(Additional information can be found on NRCan's website at http://www.nrcan.gc.ca.

A. Societal Context

As Canada enters the new millennium, the sustainable development and use of its natural resources pose a number of challenges for all Canadians as we recognize the importance of resources stewardship and enhanced environmental performance to the health and well-being of present and future generations. These challenges include to:

- ensure that resource development and use are sustainable given the diverse economic, social and environmental values that Canadians view as important;
- remain competitive in an increasingly knowledge-based and globalized economy; and,
- maintain a business climate that attracts investments in the natural resources sector.

Key factors influencing the Department's policy and science and technology research activities are as follows.

Economic

According to the United Nations, global economic growth is being driven by an estimated $22 trillion in world trade annually, doubling in the past 25 years. This level of growth has been supported by a twelve-fold increase in world trade since 1945 and a rapid increase in foreign investment.

Canada's natural resources sector and related industries are leading contributors to the country's wealth. Canada is the world's largest exporter of forest products; its mining industry is a dominant player in international markets; its geomatics industry – which supplies surveys, mapping, remote sensing and geographical information and services – is growing at a rate of 12 percent per year; and its energy sector contributes significantly to Canada's positive trade balance. In 1999, Canada's natural resources sector accounted for nearly $90 billion in gross domestic product with exports totaling about $104 billion annually. This represents over 31 percent of Canada's total export sales and represents an estimated $66 billion contribution to Canada's balance of trade.

To maintain and enhance Canada's competitive position, natural resource industries must continue to remain innovative and productive. The key challenge for Canada is to create a sound business climate for sustainable resource development so as to enable the development of new value-added

products and to promote Canada as an investment destination of choice.

Social

Approximately one and a half million Canadians are employed directly or indirectly in jobs created by the natural resources sector. As well, approximately 652 rural and remote communities across Canada, including Aboriginal communities, are dependent on the sector for their social and economic well-being.

Because the natural resources sector impacts on the lives of so many Canadians, there is a growing public need to participate in those decision-making processes affecting natural resources. Thus the Department works collaboratively with the provinces and territories, industry, advisory bodies, other federal departments, Aboriginal and non-government organizations, and environmental groups to ensure that:

- clients, stakeholders and partners have venues and opportunities to voice their concerns and suggestions;
- national and/or community consensus regarding the direction of natural resources is reached in a democratic fashion;
- national commitments are established, put into action, and monitored; and
- opportunities and lessons learned from natural resource decisions are shared across all regions of the country.

The consensus building approach, employed by the Department in establishing its strategic directions, contributes to increased public awareness and understanding of the issues, as well as to the collective vision, mission, values and goals of the natural resources sector. This approach also helps to strengthen the federation by sustaining rural communities.

Environmental

During the past hundred years, the natural environment has borne the stresses imposed by a four-fold increase in human numbers and an eighteen-fold growth in world economic output. With world population projected to increase to nearly 9 billion by 2050, from the current 6 billion, the potential for doing irreparable environmental harm is obvious. One of two jobs worldwide – in agriculture, forestry and fisheries – depends directly on the sustainability of ecosystems. Even more important, so does the planet's health – and our own.

Society's awareness of the negative effects of its activities on human health and on ecosystems has prompted governments, businesses and citizens to act in different ways. Canadians can achieve economic benefits through sound environmental practices and the development of green technologies, products and services. By adopting the principles of eco-efficiency, which encompass the reduction of environmental impacts, we can simultaneously reduce resource consumption.

Through public input processes, NRCan has learned that the public's key issues in 2000, regarding the environment, include maintaining a healthy environment; leaving a legacy, conserving biodiversity and protecting ecological systems; and measurement, indicators and accountability for the sustainable management of natural resources.

NRCan's priorities, among others, include reviewing legislation – the Canadian Environmental Protection Act, the endangered species legislation, and the Canadian Environmental Assessment Act – and addressing forestry issues, such as funding of forest research institutes. As the lead department domestically for climate change,

the Department has focused in addressing increased greenhouse gas emissions caused by natural processes (e.g. forest fires caused by lightning) and human activity (e.g. the burning of fossil fuels). These processes are believed to be the main factors causing the world's climate to change. A shift of only one or two degrees Celsius in the mean annual temperature factored over a long period of time, could cause vegetation and permafrost boundaries to shift by as much as 100 kilometers or more along with changes to river flows and the water levels of lakes. It is feared that continued global warming could trigger serious consequences for Canada's environment, economy and population health.

In response to the Kyoto Protocol (December 1997), Canada made the commitment to reduce its greenhouse gas emissions to six percent below 1990 levels by 2008-2012. To this end, the Department is pursuing the following objectives:

- to ensure that all key stakeholders have a say in the development and implementation of proposed greenhouse gas reduction approaches and in establishing acceptable methodologies in pursuing the reduction target;
- to develop S&T research and policy development strategies and options that improve national energy efficiency and that help protect the environment from natural and human disturbances while creating economic opportunities;
- to generate a sound S&T knowledge base to ensure that Canadians fully understand the impacts of climate change on Canada's environment; and
- to ensure that effective mitigation and conservation strategies are employed to help Canada's environment (e.g., forest ecosystems) protect itself from or adapt to the negative effects of climate change.

Complemented by a targeted outreach program of public education, the results of these initiatives will contribute to reaching Canada's national target and to further reduce greenhouse gas emissions over the longer term.

Good Governance

Good governance is premised on strategic partnerships with all levels of government and a broad range of stakeholders. These strategic partnerships form the backbone for furthering the public good in areas such as Canada's stewardship of natural resources, public health and safety, strengthening the federation and providing public services that are responsive to the needs of citizens.

In our knowledge-based society, the availability and easy access to sound S&T and policy information are key to achieving the government's objectives. The Government of Canada Framework for Science and Technology Advice is one meaningful tool for NRCan in meeting the challenge of improving its ability to anticipate science-based issues, draw on the best sources of science advice, and bring sound science to bear on policy and regulations. Another, is to continue to develop and make accessible user-friendly tools and databases, such as *ResSources*, for informed public decision-making. The Department will also take steps to renew, retain and recruit an adaptable workforce, well-equipped and knowledgeable in science and technology and policy capacity to address the economic, social and environmental challenges it faces. The result will be empowered employees capable of contributing to high quality government programs and services.

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B. Partners in our Accomplishments

The Department exercises good governance, using innovative ways to deliver departmental programs through partnerships, in collaboration with other federal, provincial and territorial governments, and with industry and stakeholders. These partnership arrangements have produced good results in cost sharing, cost recovery and the transfer of new technology. They represent an effective and efficient approach to developing and delivering S&T and other programs that support Canada's progress toward sustainable development. By maintaining and, in some areas, enhancing a positive federal presence, NRCan and its partners are able to work together more effectively in achieving objectives in an era of resource constraints. In most cases, each partner is helping NRCan to achieve more than one goal. Therefore, to avoid repetition, a break down of partners by goal is not given. The Department's key co-delivery partners are listed below.

Other Government Departments (OGDs)/Agencies

- Agriculture and Agri-Food Canada
- Canada Mortgage and Housing Corporation
- Canadian International Development Agency
- Canadian Space Agency
- Climate Change Secretariat
- Environment Canada
- Finance Canada
- Fisheries and Oceans Canada
- Foreign Affairs and International Trade Canada
- Health Canada
- Human Resources Development Canada
- Indian and Northern Affairs Canada
- Industry Canada
- Investment Partnerships Canada
- Justice Canada
- National Defence
- National Research Council
- Public Works and Government Services Canada
- Revenue Canada
- Statistics Canada
- Team Canada Inc
- Transport Canada

External

- Aboriginal Organizations
- Academia
- Industry
- International Governments and Agencies
- Non-Government Organizations
- Provincial/Territorial/Municipal Governments
- United Nations Agencies

Portfolio

- Atomic Energy Control Board
- Atomic Energy of Canada Limited
- Canadian Wheat Board
- Cape Breton Development Corporation
- National Energy Board
- Newfoundland and Nova Scotia Offshore Petroleum Boards

C. Chart of Key Results, Departmental Priorities and Commitments, and Speech from the Throne Themes

The table below aligns NRCan's Chart of Key Results (CKR), departmental priorities and commitments for 1999-2000, and themes from the Speech from the Throne (SFT). The CKR outlines departmental goals and objectives which are the foundation for all departmental planning and performance reporting, as well as its Performance Measurement Framework, and Sustainable Development Strategy. The goals outline the impacts that NRCan expects to achieve for Canadians over the long-term whereas the objectives represent results or outcomes for the short- and medium-term.

Guided by the themes of sustainable development and good governance, the Minister of Natural Resources has developed a strategic plan, *Winning in the Knowledge-based Economy*, to address issues and seize opportunities in the resources sector and to contribute to the achievement of government opportunities. Elements of the action plan can be found under the NRCan priorities and commitments for 1999-2000 column below.

In October 1999, the Government reaffirmed its priorities in the SFT, which articulated a key overall objective for government: building a higher quality of life for all Canadians. The table below demonstrates the linkages between NRCan's priorities and commitments and those from the SFT. Performance accomplishments against these commitments can be found under each goal in sub-section D.

Chart of Key Results (Goals and Objectives)		**What did we aim to achieve this year?**	**Speech from the Throne Themes**
To provide Canadians with:	**As demonstrated by:**	**NRCan Priorities and Commitments for 1999-2000**	
1. Information to make balanced decisions regarding natural resources.	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. Greater national and international cooperation and consensus on sustainable development issues, policies, goals and actions. Fiscal, regulatory and voluntary approaches that encourage the sustainable development of natural resources.	**Resource Innovation** • Improve access to resource knowledge and information for enhanced service to Canadians, through our knowledge initiative *ResSources* and GeoConnections. • Develop a strategy for resource innovation. **Work Opportunities** • 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. **Policy Advice** • 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.	**Quality of Life** **Youth** **Dynamic Economy:** • ***Knowledge Infrastructure*** • ***Skills and Knowledge***

Chart of Key Results (Goals and Objectives)		What did we aim to achieve this year?	Speech from the Throne Themes
To provide Canadians with:	**As demonstrated by:**	**NRCan Priorities and Commitments for 1999-2000**	
2. Sustainable economic and social benefits derived from natural resources for present and future generations.	Greater economic opportunities and encouraging investment in innovative and higher-value uses of natural resources. Expanded access to international markets for Canadian resource-based products, knowledge, technologies and services. Increased capacity of Aboriginal, rural and northern communities to generate sustainable economic activity based on natural resources.	**Resource Innovation** • 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. **Resource Trade & Investment**: • 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. **Regional Approach** • Develop increased regional focus to strengthen partnerships across all regions and enhance economic opportunity related to natural resources. **Work Opportunities** • Develop a pilot Métis Forestry Program. • Increase Aboriginal and Northern community capacity	**Quality of Life** **Youth** **Dynamic Economy** • ***Trade Promotion*** • ***Skills and Knowledge*** • ***Knowledge Infrastructure*** **Environmental Quality** **Stronger Communities** **Aboriginal People**

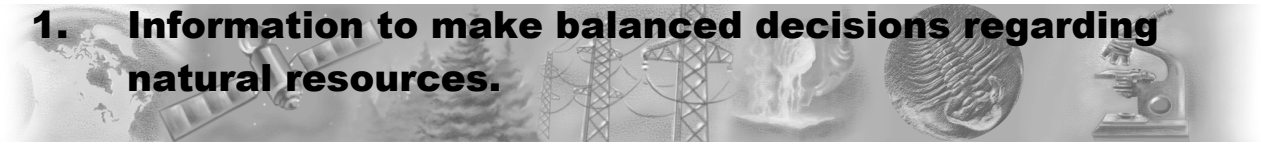
Chart of Key Results (Goals and Objectives)		What did we aim to achieve this year?	Speech from the Throne Themes
To provide Canadians with:	**As demonstrated by:**	**NRCan Priorities and Commitments for 1999-2000**	
3. Strategies to manage the environmental impacts of natural resource development and use.	Canada addressing its international Kyoto commitment to reduce greenhouse gases. Scientific research, technologies and stewardship practices that reduce environmental impacts, conserve biodiversity, and increase the efficiency of natural resource development and use. Canada's environment safeguarded from the risks associated with natural resource development and use.	**Climate Change** • Lead in key aspects of climate change policy development, program development and delivery of science and technology. • 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. **Environment** • Support research and development of sustainable development technologies and practices. • Provide policy advice to Environment Canada, based on the principles of sustainable development, for review of legislation such as the Canadian Environmental Protection Act (CEPA), the endangered species legislation, and review of the Canadian Environmental Assessment Act. • Address forestry issues, such as funding of forest research institutes. **Risk Management** • Develop frameworks for risk management and values and ethics.	**Quality of Life** **Dynamic Economy** **Health and Quality Care** **Environmental Quality**

Chart of Key Results (Goals and Objectives)		What did we aim to achieve this year?	Speech from the Throne Themes
To provide Canadians with:	**As demonstrated by:**	**NRCan Priorities and Commitments for 1999-2000**	
4. Safety and security in the natural resources sector.	Canadians safeguarded from natural hazards. A national framework for spatial positioning, mapping and boundary maintenance. Safe use of explosives and pyrotechnics. Enhanced safety and security in Canada's natural resources sector.	**Health and Safety** Deliver on mandated responsibilities for the health and safety of Canadians in regard to explosives, geological survey and mapping, for example: • safety and security from natural hazards through environmental monitoring, risk assessments; • spatial positioning, mapping and boundary maintenance through a Canadian reference framework and current aeronautical charts; • explosives safety through improved methods and facilities.	**Quality of Life** **Health and Quality Care** **Environment**
5. A department that is efficiently and effectively managed.	Responsible use of approved resources. Continuous improvements of NRCan products, services and operations. Increased use of leading-edge environmental management tools and practices for NRCan operations. Increased waste reduction from NRCan operations. Increased efficiency of energy and other resource use in NRCan operations. Increased use of goods and services that are eco-efficient.	**Overall Management** • Effectively manage Natural Resources Canada in a manner which is responsive to changing priorities; to demonstrate interdepartmental leadership in addressing management challenges; and to ensure NRCan's workforce will have the right skills and expertise to meet the Department's commitments and obligations now and in the future. **S&T Capacity** • Begin to effectively address issues related to NRCan's S&T capacity; and to raise awareness of government-wide S&T capacity issues and provide leadership in finding effective means to address them.	**Youth** **Health and Quality Care** **Environment** **Aboriginal People**

D. Performance Accomplishments

This sub-section includes performance information against departmental priorities and key commitments for 1999-2000. In addition, given that we had made a commitment in our 2000-2001 Report on Plans and Priorities (RPP) to systematically report on all 36 performance indicators by 2003, this report provides performance information on seven specific performance indicators; that information is presented in quadrant form under each goals. Performance information against transfer payment programs in excess of $5 million/year and achievements that reflect the spirit of the Social Union Framework Agreement accountability principles are also presented as an integral part of NRCan's performance accomplishment story-line. Associated costs have been described, where appropriate.

Performance information on specific themes can also be found in annexes, starting on page 66. Information on other departmental achievements, not appearing in this report, is available on the various web sites shown starting on page 63 and within sectors as part of their business and operational plans.



1. Information to make balanced decisions regarding natural resources.

Objectives	Performance Indicators
1.1 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.	**1.1.1** User satisfaction with relevance, accessibility and quality of information.* **1.1.2** Public awareness of the importance and relevance of the natural resources sector, its issues, and NRCan's S&T. **1.1.3** Adoption of NRCan-supported technology and practices.
1.2 Greater national and international cooperation and consensus on sustainable development issues, policies, goals and actions.	**1.2.1** Participation in, and influence on, national and international multi-stakeholder approaches to sustainable development issues. **1.2.2** Degree of leveraging by NRCan from shared S&T projects.*
1.3 Fiscal, regulatory and voluntary approaches that encourage the sustainable development of natural resources.	**1.3.1** Participation in, and influence on fiscal, regulatory and voluntary sustainable development initiatives. **1.3.2** Influence of NRCan's S&T-based recommendations on regulatory regimes.

* Performance information on the above indicators is included at the end of this sub-section, on pages 18 and 19.

What did we accomplish?

Meeting Canada's Geospatial Challenge –Geospatial information really answers the question "Where on earth is it?". For example, using computerized geospatial information, remote and rural communities are better equipped to make sound business and land-use decisions. Disaster-relief workers can pinpoint the exact location of phone and power lines, roadways, schools and administrative boundaries, enabling them to respond quickly,

safely and effectively to the needs of the communities. Governments are better able to monitor the environment, manage natural resources, deliver programs and establish policies.

GeoConnections, a five-year $60 million national partnership initiative, will provide Canadians with ready access to this information. This initiative was established to make Canada's geographic information, applications and services accessible to Canadians over the Internet, and to stimulate the geomatics industry and the knowledge-based economy.

Although Canada faces a number of challenges in creating this geospatial infrastructure, pursuing this project is important because of its benefits to Canadians and the growing impact of geospatial information on Canadian society. Economically, it is essential to the competitiveness of knowledge-based industries. Socially, it can lead to greater quality of life for Canadians because their communities, towns and cities are safer, better planned and better organized. Environmentally, geospatial information provides vital information about a wide variety of issues, such as global climate change or a local spill of hazardous chemicals.

In addition to its official launch in August 1999 and a cross-Canada public awareness campaign throughout the fall and winter, specific accomplishments over the reporting period include the March 2000 launching of GeoInnovations, a five-year $11 million industry partnership program and the announcement of 28 industry-led projects selected to spur the development of innovative, on-line geomatics tools, applications and services. These projects are carried out across the country and include a world conservation atlas, a water-quality data system and an emergency response system, among others. The Government of Canada's $2.4 million contribution to these projects led to an additional $3 million investment from private-sector and other public-sector partners.

The geomatics industry (the application and manipulation of geospatial data) is expected to expand quickly. GeoConnections' support will be important as Industry Canada is forecasting 12 percent direct employment growth per year, potentially creating 16,000 new jobs over the next five years in the geomatics sector. The initiative will also promote the geomatics industry's efforts to expand its position in the increasingly competitive $20 billion world market, which is growing by 12 percent each year. Additional information regarding GeoConnections is available at www.geoconnections.org.

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Canada Implements 121 National Forest Strategy Action Plans – The on-going pursuit of national sustainable resource development is based on public participation and in the willingness of Canadians to reach consensus on highly diverse natural resources issues.

Towards this end, NRCan is committed to bringing these diverse interests together in collectively establishing Canada's national and international natural resources agenda. For example, NRCan has been implementing Canada's second National Forest Strategy (1998-2003) and its companion piece – The Canada Forest Accord. Signed by some 44 government and non-government leaders, the strategy establishes the vision, beliefs and the nine strategic directions that Canadians are pursuing, puts forth 43 principles, 35 objectives and 121 action plans aimed at the collective goal of sustainable forests nationwide.

In 1999, the nation-wide action plans were developed and approved by the Canadian Council of Forest Ministers (CCFM). Of these, 79 consist of specific federal responses to the strategy. The federal government's efforts, and those of the provincial and territorial governments and non-government organizations that signed the Canada Forest Accord, will be evaluated by an independent evaluation panel this year, and in 2003. The panel's recommendations will assist in adjusting and enhancing action plans to better face the challenges ahead and to influence the development of the successor strategy – all of this in time for its presentation at the XII World Forestry Congress, Québec City, 2003, which Canada has been elected to host.

Detailed information on Canada's National Forest Strategy is available at the following web-site address:
http://www.nrcan.gc.ca/cfs/nfs/strateg/control_e.html

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Partnering Efforts Lead to Enhanced Community Capacity Building in Sustainable Forest Management – Many Canadian communities depend on the forest environment for their social, cultural, and economic well-being. Canada's Model Forest Program – widely recognized for developing ongoing effective approaches to sustainable forest management – established a network of 11 living laboratories across the country where people with a direct interest in forestry, supported by up-to-date science and technology, could participate in decisions about how forests could be sustainably managed. At the heart of each model forest is a group of partners having different perspectives on the social, economic and environmental dynamics within their forest – perspectives which are necessary to make informed and balanced decisions about how to manage the forest.

Model forests are rooted in their local area and partners are engaged in activities to enhance the capacity of local people to participate in sustainable forest management. For example, a Community Development Impact Model, developed through the Lake Abitibi Model Forest, has provided community decision-makers with the ability to estimate key socio-economic impact data based on anticipated changes in benefits derived from the forest. This model is currently being modified for use within local First Nation communities.

A Long Beach Model Forest (LBMF) community internship initiative includes local people, particularly youth, trained and employed as research and project apprentices. These internships build capacity and strengthen the understanding of resource management issues in the forest dependent communities of the LBMF. Through on-the-job training, local people become aware of careers in science-related fields which have been overlooked in isolated forest-dependent communities until recently. As well, the apprentices have acquired scientific research skills and locally-relevant ecological knowledge. The positions have led to permanent placements for residents in the area's Geographic Information System, Parks Canada, local research and inventory projects, value-added industries, and tourism. Some participants return to universities to study in related science fields. According to the National Forest Strategy, "woodlot owner awareness, education and knowledge are of major importance for the attainment of sustainable development of woodlots". The Bas-Saint-Laurent Model Forest has established a highly successful voluntary wetland conservation program for private forest lands. The project aims to convince woodlot owners of the ecological importance of protecting wetlands, and encouraging them to sign a memorandum of understanding agreeing to

conserve these habitats. This stewardship formula has a strong potential for ensuring the conservation and sustainable management of environmentally sensitive areas in small private forests.

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Moving Towards Sustainability –
In keeping with the adage that "you can't manage what you cannot measure", the Government of Canada views the development of sustainability indicators as a priority. Sound criteria and indicators (C&I) will allow us to measure society's progress towards sustainable production and use of our natural resources.

For instance, Canada's Minerals and Metals Policy called for a collaborative approach to the development of indicators. In response, NRCan convened an international workshop and held initial discussions on indicators for minerals and metals with the World Bank, the World Resources Institute, the U.S. Department of the Interior, the U.S. Geological Survey and Minerals and Energy Research Network in the United Kingdom. Participants from Japan, Chile, Australia and Canada – representing industry, government, and academia – were hosted by Noranda at its Technology Centre in Pointe Claire, Quebec.

NRCan recognizes that the process of development is as important as the final outcome, since success will be measured by the degree of acceptance by all stakeholders of the indicators. Moreover, given that a number of initiatives are underway internationally to develop measures of our progress towards sustainable development, if Canada wishes to influence outcomes and participation of others, then we must develop a made-in-Canada approach. To this end, NRCan established and led a 26-member multi-stakeholder group to develop a values-based framework for the development of minerals and metals indicators of sustainable development. Notably, the group achieved a consensus on the specific wording for the vision, goals and objectives that will be used to consult more broadly. This values-based framework will provide the foundation for full indicator development in the fall of 2000.

The C&I process for Canada's mineral and metals and energy sector continues to make steady progress. The forestry sector, through the Canadian Council of Forest Ministers (CCFM) and NRCan, has also been making great strides over the past years at the national and international levels. Information on Canada's sustainable forest management C&I and its international equivalent "The Montreal Process" can be found on the following web sites or the annex on page 66 of this report:
http://www.nrcan.gc.ca/ccfm/pi/
http://mpci.org/.

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Stewardship: a National Responsibility
Canadians want to protect the country's vast natural heritage and are concerned about threats to wildlife species and losses of habitat. Stewardship is an important tool which can be used as a voluntary complement to regulation to sustain and restore biodiversity and to recover species and habitats at risk on managed and privately-owned lands.

Biodiversity stewardship can be good both for wildlife and business. Indeed, for firms in the natural resources sector, recognition for "green" practices can improve market access, yield competitive advantage and advance sustainable development.

To this end, NRCan, in cooperation with Industry Canada and the University of Waterloo, launched an *Inventory of Mining Industry Practices to Conserve Wildlife and Habitat in Canada* on the World Wide Web at http://mmsd1.mms.nrcan.gc.ca/business/inventory/. The Department has also completed a similar inventory to reflect the practices of logging and woodland operators, oil and gas, pipelines and

electricity industries respectively. These inventories have been used to promote biodiversity stewardship activities by industry, and have been identified as useful ways to exchange existing conservation practices between resource sectors and across Canada.

Since 1997, NRCan has been working in partnership with Industry Canada to develop the Biodiversity Stewardship in Resource Industries (BSRI) initiative aimed at promoting the use of voluntary stewardship activities by natural resource industries to conserve wildlife and habitat. The BSRI initiative involves industry, and conservation and Aboriginal groups, working in partnership to prevent species from becoming at risk and to assist with species recovery.

As part of this initiative, NRCan undertook significant preparations for the BSRI Forum in its role as promoter and facilitator. The April 2000 Forum brought together over 100 senior officials from natural resource companies, conservation groups and Aboriginal organizations to share conservation practices and to develop consensus on the path forward for a multi-sector national stewardship initiative. Consensus was reached among Forum participants that NRCan would help to facilitate partnerships among stakeholders aimed at establishing a BSRI Secretariat. The next steps will be to identify and implement pilot projects designed to conserve wildlife and habitat and to promote voluntary biodiversity stewardship activities by the natural resources industry.

Regulations also play a meaningful role in protecting our natural heritage. Moreover, they need to be based on the best available information and science to ensure that environmental protection objectives are efficiently met without needlessly limiting development of our natural resources. For example, the Metal Mining Liquid Effluent Regulations were promulgated in 1977 to protect fish and fish habitat from potential impacts of mining activity. During the process for updating and strengthening these regulations, NRCan led the Aquatic Effects Technology Evaluation (AETE) program, a four-year $3.4 million government/industry science-based program which evaluated and identified cost-effective environmental monitoring technologies available to the Canadian mining industry to assess its impacts on the aquatic environment. AETE did not make recommendations for regulatory revisions, but has provided the tools to implement regulatory requirements. In fact, results from AETE were used by government and industry to design an environmental effects monitoring program for Canadian mines. And because questions about the validity of specific tests for determining toxicity in mining effluents remain, the Toxicological Investigations of Mining Effluents (TIME) Network was established in 1999 as a multi-stakeholder initiative coordinated by NRCan to increase knowledge regarding toxicity issues through scientific research. The Mining Association of Canada contributed $1.2 million to the AETE program, and is sharing the cost for the first year of the TIME Network. This reflects industry's stake in a workable long-term regulatory strategy which protects wildlife and habitat. Additional information regarding AETE is available at http://www.nrcan.gc.ca/mets/aete, whereas TIME is available at http://envirolab.nrcan.gc.ca/time/time-e.htm.

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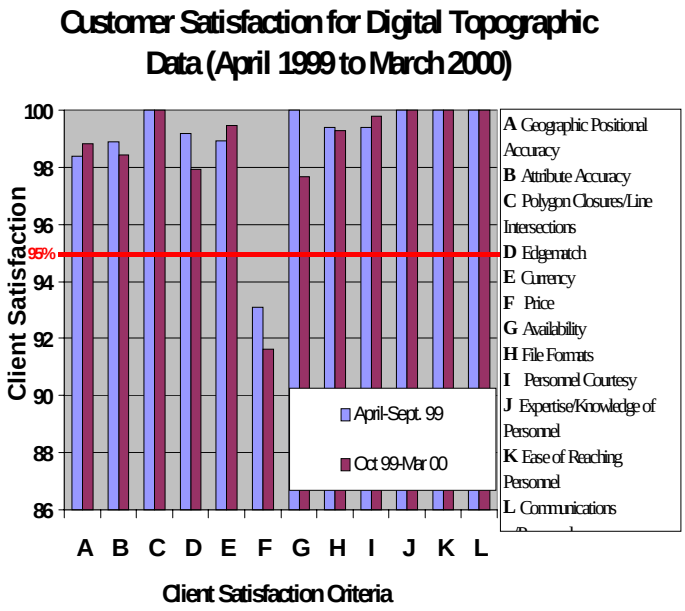
Goal 1, Objective 1.1 - Easily accessible and integrated knowledge.
Indicator 1.1.1: User satisfaction with relevance, accessibility and quality of information.
Target: Maintain or improve current levels of use and satisfaction.



NRCan's Contribution

- NRCan recognizes the value in measuring, monitoring and reporting on client satisfaction performance. The Digital Topographic data indicator is put forward as a positive example – for the current document – of how systematic measuring, monitoring and reporting on client satisfaction performance is taking place within the Department. It is considered to be representative of the kinds of client satisfaction measurement and reporting initiatives that NRCan is pursuing.
- NRCan is currently exploring the issues associated with measuring and reporting on overall customer satisfaction in a department characterized by diversity and substantial workload.
- In areas where satisfaction levels are below 95%, NRCan ensures that client feedback is integrated into revisions and/or upgrading of product development and service delivery.
- ResSources (NRCan's knowledge management initiative)/ Government On-Line.

What Does the Graph Mean?

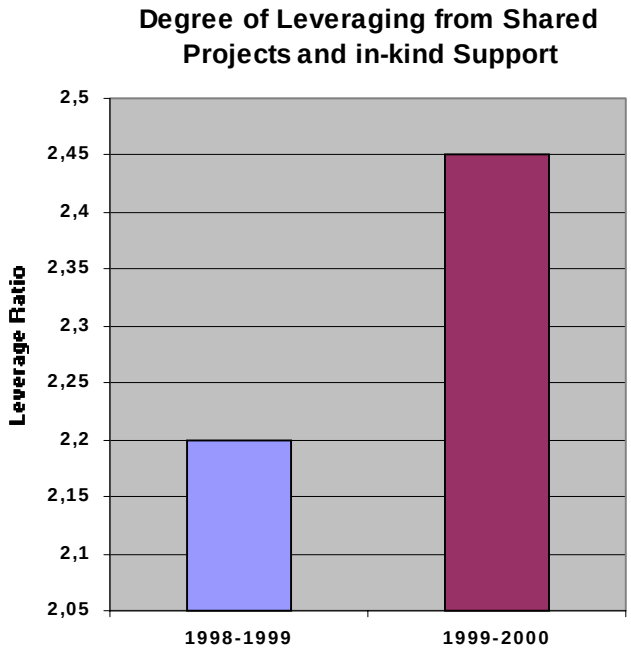
- The graph illustrates the level of client satisfaction with one of the NRCan products/services – 'Digital Topographic Data' – as measured for two time periods (April-Sept. '99 and Oct. '99 to March '00) against 12 criteria*. The solid line running across the graph at the 95% level represents the client satisfaction target for this product/service.
- The graph shows that client satisfaction levels have been relatively high, with slight variations, against all criteria (92-100%) for both time periods. It indicates that the level of performance has been very strong in relation to 'Product Currency' (98-99%), 'Availability' (98-100%), 'Personnel Expertise and Knowledge' (99-100%) and 'Communication' (100%). Satisfaction levels have been somewhat lower against the criteria of 'Price' (92%), below the 95% target.
- These data are comparable to the results of previous annual (1994-1998) and periodic (1998-1999) surveys, which consistently displayed satisfaction levels over 95%. Past satisfaction levels regarding Price have also been slightly lower than those associated with other criteria.

Next Steps

- NRCan is pursuing continuous improvement in the area of client satisfaction performance measurement, reporting and monitoring.
- Through ResSources, NRCan will be developing service standards for electronic service delivery.
- The data example points to areas for improvement relative to established target levels. In the case of client satisfaction with product price, NRCan is addressing issues such as cost recovery and pricing guidelines that have contributed to the gap between the target and actual scores.
- NRCan is examining options for developing common, umbrella, or "roll-up" client satisfaction performance measurement tools that can be used to provide a better understanding of overall satisfaction with departmental products and services.
- Once this feasibility assessment is complete, recommendations will be made with respect to the most suitable path forward in this area of performance measurement and, if required, a project plan will be developed.
- As a federal lead on S&T, NRCan will develop an e-cluster focused on sustainable development in support of Government On-Line.

* Performance is normally assessed against 17 client satisfaction criteria. We have removed several criteria from this graph for ease of reader viewing and understanding. The results are based on 349 responses.

Goal 1, Objective 1.2 - Cooperation and consensus toward sustainable development.
Indicator 1.2.2: Degree of leveraging by NRCan from shared S&T projects.
Target: Maintain or improve total funds and in-kind support leveraged.



NRCan's Contribution

- NRCan places great importance on partnering, not solely for sharing costs but also as an indication of the relevance of its activities.
- Leveraging is obtained from four mechanisms as defined in the *Framework for Revenue Generation*:
  - cost-shared projects involve NRCan and partner(s) jointly funding work undertaken solely by a third party;
  - task-shared projects involve NRCan and partner(s) each funding and undertaking their part of a project;
  - joint projects involve NRCan and partner(s) undertaking and funding work, in which money may change hands; and
  - in-kind support, is payment in goods or services rather than cash and the informal support to NRCan programs that is received from clients.
- In-kind support is difficult to quantify; but the toolkit that accompanies the *Framework for Revenue Generation* includes a recommended process for assessing the value of such informal support in a consistent manner.

What Does the Graph Mean?

- In 1997, NRCan implemented its *Framework for Revenue Generation, External Funding and Collaborative Activities*[1], which established a common set of guiding principles and terminology that enabled NRCan to identify and quantify leveraged funds in a consistent manner. Data were collected in a consistent fashion starting in 1998-99.
- Leveraging increased from 2.20 in 1998-99 to 2.45 in 1999-00. This represents a degree of external support on shared projects and programs. Actual investments in shared undertakings increased by 2% for NRCan and 13.8% for partners. The actual dollar value of leveraged support may vary significantly from year to year depending on the scope and nature of the shared activities. It may, for example, be significantly higher in a year in which a single short-term multi-million dollar shared project is undertaken.

Next Steps

- NRCan will strive to enhance its leveraging capabilities through multi-partner, multi-stakeholder mechanisms and programs such as the Climate Change Action Fund, the Sustainable Development Technology Fund, the Canadian Lightweight Materials Research Initiative (CliMRI), its Mine Automation Program, and its Resource Innovation Action Plan, in which multi-partnering is entrenched as a fundamental operating principle.
- These efforts will involve partnerships with a wide range of other performers - other federal departments and agencies, provincial departments and agencies, the private sector, non-government organizations and international organizations.

[1] For further information on this framework, see http://www.nrcan.gc.ca/dmo/scitech/revgen/revfrm_e.html

2. Sustainable economic and social benefits derived from natural resources for present and future generations.

Objectives	Performance Indicators
2.1 Greater economic opportunities and encouraging investment in innovative and higher-value uses of natural resources.	**2.1.1** Economic influence of NRCan S&T. **2.1.2** Employment levels and productivity in resource and resource-related industries.* **2.1.3** Contribution of the natural resources sector to the GDP. **2.1.4** Capital investment in resource and resource-related industries.
2.2 Expanded access to international markets for Canadian resource-based products, knowledge, technologies and services.	**2.2.1** Value and percent of exports of resource-based products.
2.3 Increased capacity of Aboriginal, rural and northern communities to generate sustainable economic activity based on natural resources.	**2.3.1** Number of shared projects and funds leveraged with rural, Aboriginal and northern communities. **2.3.2** Employment level of Aboriginal people and northern residents in resource sectors.

* Performance information on this indicator is included at the end of this sub-section, on page 30.

What did we accomplish?

Resource Innovation – As a science and knowledge-based department, NRCan must ensure it has the ongoing capacity to deliver sound science, knowledge and technology that will respond to emerging priorities and opportunities. The Department supports innovation and greater productivity throughout the natural resources sector through a number of endeavours such as lessening the environmental impacts of resource development, using our resources more efficiently, encouraging cutting-edge exploration technologies, and strengthening partnerships that will contribute to spurring resource innovation.

As one example, new staking of 30,000 hectares of land for gold exploration in the vicinity of the Meadowbank gold deposit in Nunavut is a result of the identification and delineation of a large region of highly anomalous gold and polymetallic (silver, zinc and lead) mineral showings by NRCan scientists who have been working since 1997 under the umbrella of the Western Churchill National Mapping Program (NATMAP). As well, identification of ancient crust in gold-bearing, fault-bounded blocks in the Red Lake study area of Western Superior NATMAP has defined new targets for volcanogenic massive sulphides and gold mineralization which prompted industry to mount a half-million

dollar exploration program in the area.

And that's not all! Following on the success of the Exploration, Science and Technology Initiatives I and II (EXTECH), promising results were released from the first season's field studies in the EXTECH III project to address the problem of declining gold production in the Yellowknife mining district. This information has already had an effect on the activities of companies, prospectors and consulting geologists working in the area. In particular, research conducted underground at the Giant Mine has assisted company geologists in solving problems related to the detailed structural geology, leading to a better understanding of the emplacement and ultimate location of associated gold deposits. On the surface, studies have identified a key exploration target for undiscovered kimberlites in the area east of Yellowknife. In 1999-2000, the costs of EXTECH III were funded by NRCan ($240,000) and its partners - Indian and Northern Affairs Canada and the Government of the Northwest Territories (total of $240,000) – with in-kind support from the area's mining industry.

Regional scale geoscience mapping projects under NATMAP continue to provide immediate information on component studies at the conclusion of each field season. Mature NATMAP projects, such as Western Superior and Western Churchill, have been able to synthesize data from three to four years of observations and laboratory analyses into a better, and sometimes revolutionary, understanding of the tectonic history of the region. Such knowledge has important implications for the occurrence of mineralized zones and for increased exploration activities and new techniques.

Canada's LITHOPROBE program continues to play a critical role in unravelling the third dimensional aspect of several NATMAP projects. This project enhances the understanding of the geological evolution of the northern parts of North America, in support of exploration for minerals and hydrocarbon resources. Leading interested industry clients on post-season field trips has become a standard facet of many NATMAP projects; this enhances the explicit knowledge contained in the published maps and reports by the addition of tacit knowledge of the scientists who have an intimate knowledge of the area.

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Players in the Energy Mix: Oil Sands, Heavy Oil and Natural Gas – To create and sustain a policy framework within which our oil and natural gas resources can be developed to the maximum benefit of Canadians of present and future generations, we must encourage development that is economically viable, environmentally responsible and socially acceptable. In 1999-2000, NRCan collaborated with the Department of Finance in the development of a complex analytical model and database to calculate and analyze in context the tax expenditures associated with the ongoing burst of development of Canada's enormous oil sands resources. NRCan's contribution to this effort involved extensive work on the structure of the model used, primary responsibility for the assembly of the database of inputs, and extensive consultations with industry representatives on the veracity of the model structure and the proposed data input values.

With respect to innovative use of technology, NRCan tested a process that will allow the processing of two million tonnes of oil sand that would normally be set aside as waste. Due to high bitumen content in these sands, the value of the recovered synthetic crude oil is approximately $30 million. The possibilities for this new technology are very promising as there is an estimated 20 million tonnes of this

type of ore in one new mine alone. Total NRCan cost for oil sands research is $8.2 million. Revenue generated and equivalent is $11.9 million.

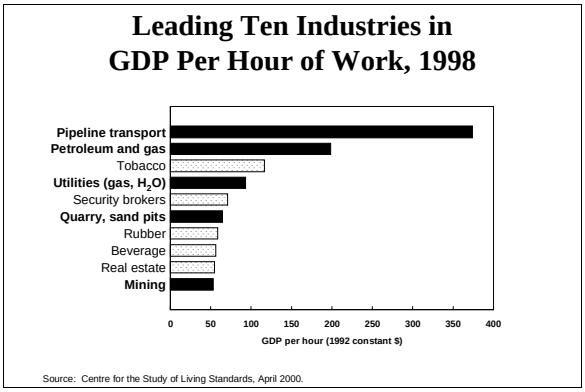
To enhance the longer-term sustainability of the oil sands, NRCan has, and will continue to work with the National Task Force on Oil Sands to develop a road map and vision for the mining, in situ, and upgrading components of the industry to 2025. The road map will also examine opportunities for new, value-added products and co-products from oil sands operations. The process will provide the industry with a longer-term direction for its evolution and will identify key technology goals and collaborative R&D efforts needed to realize that evolution.

NRCan's National Centre for Upgrading Technology (NCUT) – a federal-provincial-industry partnership – has provided advice on catalyst optimization, process assessments and upgrader-hydrocracker interactions to Alberta's major synthetic crude producers. This has allowed industry to make decisions to maximize economic benefits and minimize negative environmental impacts. NCUT is the only R&D laboratory in Canada with the facilities and expertise to provide such advice.

Through the Consortium on the Conversion of Natural Gas, NRCan – one of seven partners in this international R&D program – has realized significant achievements, including the development of a novel process for direct conversion of natural gas to value-added oxygenated products, a process that is more efficient, and that is a net producer of energy; and developed a methodology for hydrogen separation, whose performance is the highest reported in terms of permeation rates and separation. This development has the potential for a range of applications in the petrochemical and fuel cell industry.

Productivity and Innovation at its Best

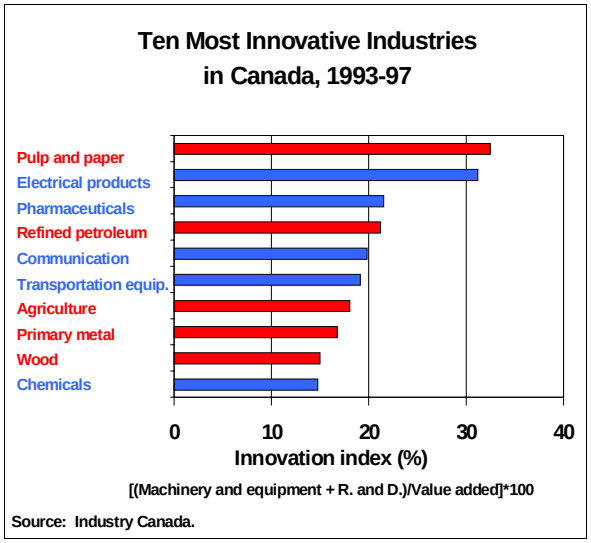
Canada's natural resources industries are high-tech and innovative. In order to sustain investment and growth in these industries, Canada must ensure the recognition and acceptance of Canada's resource industries as being an integrated part of the knowledge-based economy and a major contributor to Canada's productivity growth.



In this regard, the Department undertook activities relating to productivity of both a policy and a technical nature. On the policy front, work has been done to provide a strong base of information, analysis and policy advice to balance the debate on comparative productivity growth between Canada's resource industries and the rest of the Canadian economy. Recent work has revealed that, based on labor productivity levels, five of Canada's top ten industries were found in the natural resources sector.

Further research, undertaken by Industry Canada, has also revealed that the pulp and paper sector is the most innovative industry in Canada (expenditures on research and development, and machinery and equipment divided by value added). The pulp and paper industry invested $4.2 billion in computer equipment over the period 1993-98 – more

than twice the level as the electronics and electrical products industry. As a result, productivity growth in this industry had averaged 2.5 percent per year over this period.



To ensure that Canada's resource sector remains competitive, NRCan conducts and sponsors scientific research to help make Canadian companies the most innovative and productive. For example, NRCan is helping small Canadian gold-mining companies work more efficiently. In 1999, NRCan increased funding of $2.5 million over three years to its Canada Centre for Mineral and Energy Technology (CANMET) for the Narrow-vein Mining Program. The funding is being used at the Experimental Mine facility in Val-d'Or, Quebec to research innovative methods to automate the extraction of gold from narrow veins. The mechanized mining equipment and techniques used for large deposits cannot be used in narrow-vein mines, and small mining operations often lack the resources to develop new technology to operate more efficiently. CANMET can work with these operations to develop and adapt technologies to meet their specific needs, which will help them lower their production costs and stay in business.

A database of methods and equipment used in narrow-vein mining is being developed through mine site visits across Canada. A key thrust of the Narrow-vein Mining Program is to identify operators' needs with respect to the development and automation of mining methods and equipment. Information developed in this program will be made available through an Internet site, allowing for easy access to results on new mining and innovative systems. It is notable that one major Canadian mining company has recently entered discussions with CANMET regarding the program's methodology for improving mine productivity. The company recognizes the potential for this innovative approach of optimizing the mining cycle to increase its productivity, even in mines with large deposits.

The Pulp and Paper research Institute of Canada (Paprican), Forintek Canada Corp. (Forintek) and the Forest Engineering Research Institute of Canada (FERIC) shared a $15 million investment by Canada allowing them to adjust to the changing structure of the Canadian industry while maintaining critical core capacities essential to maintaining the competitiveness of the forest sector. For example, with the objective of maximizing wood recovery, researchers at FERIC have been testing a portable small wood debarker to improve wood recovery in small diameter logs and tree tops; Forintek has designed the Video Tooth Inspector, which uses video imaging to assess the wear of fine cutting saws; and Paprican, in partnership with other Canadian researchers, successfully developed a process which prevents the yellowing of mechanical pulp. This opens up a range of high value-added, long life paper grades that researchers say could eventually double or quadruple the global demand for mechanical pulp.

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Global Business Opportunities – Trade missions and visiting foreign government and business delegations to Canada are essential to cultivate trust, as well as an understanding about our programs and policies, and to explore and enhance business opportunities. To this end, NRCan, in collaboration with the Department of Foreign Affairs and International Trade (DFAIT), the provinces, territories and key stakeholders participated in international trade and investments missions and hosted many foreign delegations to Canada.

For example, 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 in January 2000. The mission furthered the commercial objectives of Canadian companies already established in the China market, and introduced new companies to the market potential and to key decision-makers. This was the largest natural resources mission ever undertaken by Canada to any market. A survey of the mission, from the business participants' point of view, revealed that two-thirds of all respondents thought the mission provided good value for the time and money invested.

The implications for Canada's natural resources industries are potentially enormous even though the results of the following events are not always immediate: signature of ground breaking agreements, contracts, and Memoranda of Understanding (MOU) (i.e., Letter of Intent between NRCan and the State Forestry Administration of China to deliver a fire management training program); holding networking sessions and meetings with China's Vice Premier and more than ten senior ministers to review natural resource-related policies and commercial issues of joint interest; and making presentations, to key Korean investors, on Canada's commitment to remain a world-class producer and supplier of natural resources. It is worthwhile to note, however, that NRCan's support to Super E™ companies, to build industry capacity for exporting Canadian energy-efficient housing, has led to the construction of 40 Super E™ houses in Japan, generating a direct benefit worth $3 million to Canada.

In addition to this important mission, NRCan participated in ten delegations to twenty-two countries and received fifteen foreign delegations. The results from these missions and visits are expected through continued discussions and the coordination of signing of agreements with private industry. As well, NRCan's work, in partnership with South American countries to help them achieve sustainable development of their mineral resources, opened doors for Canadian consulting and supply companies. With the Canadian International Development Agency (CIDA) sponsorship, the Department is implementing capacity-building projects in environmental management practices related to mining in Brazil ($1 million), and Guyana ($4 million). As a result, 12 Canadian companies, so far, have been able to create links for future business with the minerals sector in these countries.

The Department is also proud to report that during its first year of operation, the Buenos Aires Trade Post for Geomatics and Geosciences has established business activities and assisted Canadian industry in securing projects in the amount of $40 million in the countries of Honduras, Peru, Argentina, Uruguay, El Salvador, Ecuador and Venezuela. It has also facilitated the signing of three MOUs with Latin American countries for

geospatial and geoscientific projects. More information on this international business strategy can be found at: www.nrcan.gc.ca/ess/bussite/

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Promoting Access to International Markets and a Competitive Business Climate – The long-term prosperity of Canada's natural resources sector is dependent upon the protection of old and the development of new markets and continued access to new capital. NRCan undertakes initiatives to address these realities, including the countering of misinformation concerning Canadian business practices abroad, ensuring Canadian firms have continued and equal access to traditional and emerging markets, encouraging international partnerships relating to the sustainable development of natural resources, and promoting an internationally competitive business climate.

For instance, to counter-balance negative and biased forest information disseminated in European markets, NRCan, in collaboration with the Canadian Council of Forest Ministers (CCFM), has renewed the International Forestry Partnerships Program (IFPP) for a five year period (2000-2005). With a CCFM approved budget of $4 million, the IFFP will: continue to promote Canada's concept and record of sustainable forest management in Europe while increasing its attention on the U.S. and Japanese markets; allow Canada to build further partnerships and alliances with foreign governments and buyers of Canadian forest products; and protect the market access of Canada's wood and paper products from the constant threat of non-tariff trade barriers.

As well, the Department, in collaboration with DFAIT and CIDA, continued to make steady progress in the pursuit of a legally binding instrument for an international forest convention. The Costa Rica-Canada Initiative provided neutral, transparent, participatory and representative fora to facilitate technical discussion, amongst more than 600 forest experts from some 130 countries, on the range of future options for all types of forests and consider possible elements of legally binding instruments. Participants gained new insight into the crucial issues of the debate at the Intergovernmental Forum on Forests (IFF) about recommending the launching of negotiations for an international forest convention. The IFF-4 decision, with respect to the parameters of a mandate for developing a legal framework on all types of forests and the establishment of the UN Forum on Forests, will allow Canada to: demonstrate that it meets or exceeds world accepted sustainable forest management requirements; better position itself to address and defeat potential market pressures and other tactics designed to disrupt Canadian forest products trade; and help the Canadian forest industry to maintain access to established customers, and to protect jobs.

NRCan has undertaken a number of activities for building partnerships between Canada and other like-minded countries in support of the sustainable development of the natural resources industry globally. For example, the operation of a Mining Group under the Canada-Russia Intergovernmental Economic Commission has enabled NRCan to strongly advance the concerns of Canadian companies operating in Russia to the Russian Government, designed to lead to tangible changes to the Russian regulatory environment to the benefit of Canadian companies. This type of activity, the support of good governance practices by foreign governments, is aimed at protecting some $60 billion in Canadian natural resources investments abroad against investment climate irregularities.

Furthermore, Canada actively participated in the first World Mines Ministries Forum and the Mines Ministries of the Americas Conference, where discussions focused on resource-related policy issues and the sharing and promoting best practices for the sustainable development of natural resources.

NRCan has also worked with OGDs, industry, and like-minded countries to address European Union (EU) market access challenges. For instance, Canada joined with a number of other countries to approach the EU and the World Trade Organization to formally express our concerns over trade restrictions (i.e., efforts to ban asbestos, recycled content in paper products, plant health viruses, wood products and wood packaging).

While NRCan's international activities are vital for the continued prosperity of Canada's natural resources sector, the Department also undertakes a wide range of domestic activities aimed at promoting an internationally competitive investment climate for Canada. For instance, NRCan led a government-industry task force, established under the Intergovernmental Working Group on the Minerals Industry, that made representations to the House Standing Committee on Industry vis-à-vis the Department of Finance-sponsored Mintz Report. The Report failed to recognize royalties as a form of taxation, and recommended a reduction in the tax benefits that are currently available to mining and oil and gas companies. NRCan raised concerns with the Report, noting that it would have a significant and negative impact on the international competitiveness of Canada's mineral industry. NRCan's efforts were rewarded by the fact that the 2000 Budget included the tax reduction but not the base broadening measures that Mintz had proposed. In addition, a change was made to the PCO-led Medium Term Planning document to reflect the reality that royalties are a form of taxation.

A further example of this type of work is the Department's involvement in transportation issues. Canada's natural resource industries account for a majority of all domestic rail and marine freight shipments. As such, a competitive and efficient transportation system is of the utmost importance in ensuring that Canada's resource industries can compete successfully in international markets. Based on a solid foundation of information and analysis, NRCan played a constructive role in helping to ensure that federal transportation policy and regulations are sensitive to the economic context of Canada's exporting industries, including our natural resource industries (e.g., the Grain Handling and Transportation Review). These departmental efforts ensure a competitive domestic investment environment, thereby encouraging employment and growth in Canada's natural resources sector.

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Creating Employment Opportunities and Enhancing Aboriginal Capacity to Practice Sustainable Forestry– Creating economic opportunities for Canada's First Nations communities in sustainable forest related activities is the primary goal of Canada's five year $24.9 million First Nation Forestry Program (FNFP) (1996-2001).

As at March 31, 2000, the FNFP received 1,218 forestry project proposals amounting to approximately $130 million in value including partner contributions. The FNFP has been highly successful in leveraging funds and has supported an estimated 800 project proposals nation wide. Since the program's inception in 1996, the total federal contribution has been estimated at $21 million while First Nations and other partners contributed over

$36 million. This partnership has exceeded all expectations and has brought the total value of forest-based projects to an unexpected high of $57 million.

Since 1996, the FNFP has generated over 40 thousand person weeks of forestry-based employment for First Nations across Canada and has been the subject of three major reviews and audits. The mid-term review conducted in 1998-99, highly endorsed the FNFP by stating 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, government and the private sector". The Auditor General's Report (released May, 2000) indicated that the main reasons for FNFP's "credible implementation" are its clear goals, objectives and roles combined with the consensus building approach based on the on-going participation of First Nations and other stakeholders in planning, design, funding and delivery.

The FNFP's accomplishments, however, cannot be assessed solely on the basis of measurable evidence. One must also take into account the human element – the success stories of individual projects and the many testimonials participating First Nations and other partners bring to the program. As well, one must account for the leadership element – particularly, FNFP's flexible management structure comprised of the multi-partnered national management committee and the provincial and territorial management committee.

In terms of specific accomplishments, the FNFP funding led to the development of an on-reserve forestry management strategy including a traditional land use study in Canada's largest reserve – the Blood Tribe's 145,000 hectare reserve in southwest Alberta. These projects led to the hiring of Aboriginal summer students to assist in preparing an inventory of archaeological sites. This type of forward planning will allow First Nations to sustainably manage their lands for generations to come. Another project in Alberta combined a wildfire-fighting course with industry training to increase stable employment opportunities for on-reserve First Nations.

From a national perspective, FNFP funding has increased First Nations' technical capacity to carry out forest-related activities such as silviculture, tree planting, log building construction, and tree nursery operations and has supported business plan development, feasibility studies, and geographic information system technician courses.

In the words of Chief Vernon Syrette, Batchewana Band north of Sault Ste. Marie, Ontario, "the projects that are being funded are making positive impacts on enhancing First Nation capacity, and will create more opportunities in the long-term.....I personally feel great satisfaction when a First Nation community receives approved funding from the Ontario Management Committee (OMC) and calls to thank me".

The joint NRCan and Department of Indian and Northern Affairs (DIAND) Program team responsible for delivering the FNFP received the Public Service Award For Excellence on June 12th, 2000. For additional information on the First Nation Forestry Program, visit its web site at the following address: http://www.fnfp.gc.ca

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Delivering our Northern Programs – NRCan delivers a large and long-standing program in the North, with scientific, policy,

regulatory and logistics responsibilities, and remains strongly committed to working in partnership with the Government of Nunavut, other federal departments, and northern communities and stakeholders towards the future social, economic and environmental well-being of Nunavut. Particularly, when NRCan distributed the Map of Canada which signified the new Territory of Nunavut in April 1999, the Nunavut Government recognized departmental commitments to serving our clients well.

In conjunction with the Government of Nunavut and DIAND, NRCan agreed to establish a physical presence in Nunavut. The Department established a Geoscience Office in Iqaluit to expand the knowledge of Canada's North and help bring exploration and investment northward, and a (Legal Survey) Client Liaison Office to provide cadastral advice, training and information on Nunavut. NRCan also employed community staff in these offices. In a joint effort, NRCan, DIAND, the Nunavut Planning Commission and regional Inuit associations hosted a successful workshop which connected 35 Nunavut stakeholders who are building capacity in land, resource and wildlife management with organizations that can provide hands-on experience with Geographic Information System technologies and mechanisms to facilitate opportunities.

With increased attention for research in Canada's High Arctic, NRCan is providing the Polar Continental Shelf Project (PCSP) with an additional $l million in funding for increased logistics support in Canada's North. Each year, the PCSP provides ground and air support services to about l50 scientific groups from federal and territorial government agencies, northern communities, university from across Canada and international agencies working in a wide range of scientific disciplines. It is widely believed that climate change will be felt first and most dramatically in the polar regions, possibly affecting the shorelines of coastal communities or infrastructure, such as pipelines. As quoted by the Secretary of State Ethel Blondin-Andrew, (M.P. for Western Arctic) "politicians, planners and business people in the North need the information scientists are currently gathering to help them make informed decisions for the future of northern communities and residents. PCSP is an important part of our efforts". In the past year, PCSP provided $4 million in logistics support to Arctic research programs comprising many discipline, of which $1.8 million was recovered from clients. It is also recognized for its support to communities and the Department of National Defence in conducting search and rescue operations and medical evacuations. More details on PCSP can be found at http://polar.nrcan.gc.ca

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Building Canada's Capacity in Renewable Energy – To overcome knowledge barriers and to facilitate decision making, the Department continued to develop program tools and technologies toward a more efficient use of renewable energy.

For example, the Department continued its work on the Renewable Energy Deployment Initiative (REDI) which aims to stimulate market demand for and to increase the awareness among professionals and building owners of commercially reliable and cost-effective renewable energy systems for space and water heating and cooling. To fulfill these objectives, NRCan undertook marketing and infrastructure initiatives. Major outcomes and results of this program, during 1999-2000, included increased efforts to develop the Canadian market for renewable, energy-

efficient and environmentally friendly ground-source heat pumps systems, and the launch of two pilot projects to promote the installation of solar hot water systems in residential markets. Since the inception of the program in April 1998, REDI has received 51 applications under the incentive component of the program representing more than $4.4 million in investments in renewable energy projects and $641,000 in REDI contributions. NRCan also sponsored eight training sessions and workshops in various locations in Canada, for more than 200 architects, engineers, product distributors and dealers, facility managers and building owners to promote and increase awareness of renewable energy heating and cooling systems.

Furthermore, NRCan developed RETScreen, a software tool to assess the potential of proposed renewable energy projects which now has 10,000 users in 160 countries around the world, and the client base is growing at the rate of 100 new users per week. RETScreen was improved in the past year with the addition of an on-line weather database, providing weather data from ground monitoring and satellite stations in over 1,000 locations in the world. In collaboration with several partners, NRCan used this tool to prepare 51 pre-feasibility studies to identify high potential cost-effective renewable energy projects in Canada's 300 remote communities. Of the 51 studies, 27 were identified as having near-term commercial viability, and more work is being done to further develop some of these projects. RETScreen can cost as little as one-tenth of the price of conventional analysis ($20 thousand) and provides significant cost savings to users. RETScreen has made significant inroads into the world's renewable energy markets and is being used more widely than other similar software tools. It can be downloaded at http://retscreen.gc.ca.

NRCan, in partnership with Conserval Engineering and Enermodal Engineering, also developed and released another software tool – SWIFT, the Solar Wall International Feasibility Tool – to help design solar air heating systems and prepare quick, accurate feasibility studies. Key features include hourly weather data for more than 300 cities, and the capability to design industrial, commercial and process air heating systems, for functions such as crop drying. SWIFT is being used by industry in Canada, the United States, Japan and several European countries.

As well, NRCan helped assess, advise, design, troubleshoot or manage district heating and cooling systems in 13 communities across Canada, from downtown Toronto to Pelly Crossing in the Yukon, to Oujé-Bougoumou, Quebec, whose district energy system has attracted international attention since receiving the United Nations Award for Sustainable Communities. More recently, NRCan's support to the community of Grassy Narrows in northern Ontario was recognized with a Public Service Award of Excellence in 2000. District energy system projects delivered by NRCan in three northern communities – Fort McPherson, Northwest Territories; Arviat, Nunavut; and Watson Lake, Yukon – received support from the Technology Early Action Measures (TEAM) initiative of the Climate Change Action Fund for their potential to reduce fuel consumption and greenhouse gas emissions. When fully operational, these projects will reduce each community's annual fuel consumption by up to 12 percent, and greenhouse gas emissions by 2,665 tonnes annually.

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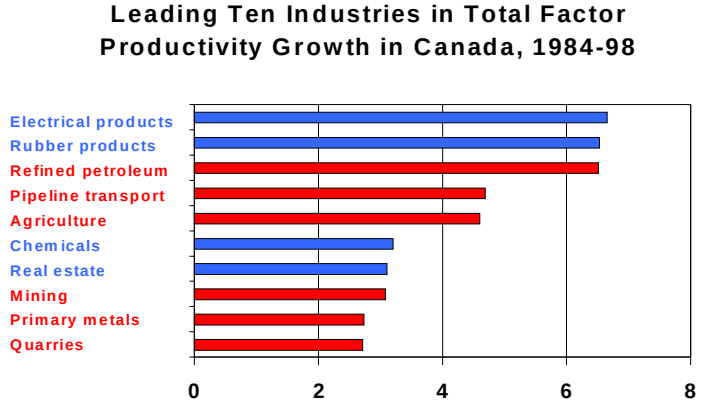
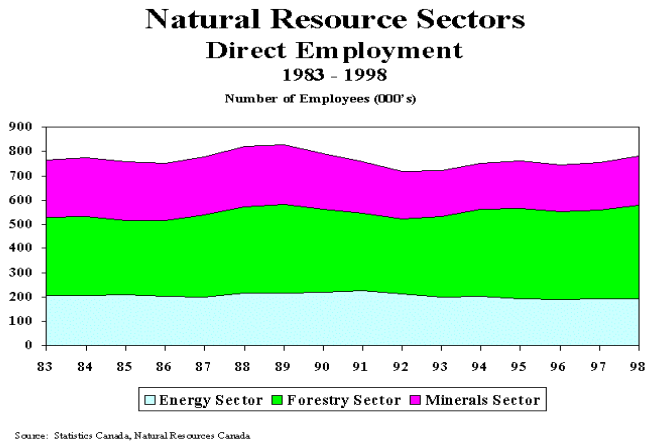
Goal 2, Objective 2.1 - Innovation and opportunity.
Indicator 2.1.4: Employment levels and productivity in resource and resource-related industries.
Target: Trend analysis and monitoring.





NRCan's Contribution

- NRCan provides accurate measurements of employment and GDP for the resource sectors by reviewing the subject matter to ensure accuracy and applicability to the resource.
- NRCan has reviewed productivity reports to determine the significant achievements of the resource industry in this area.
- NRCan provides contributions to projects done in conjunction with private industry that will improve the productivity of workers, including:
  - focuses on economic growth and quality of life;
  - an innovation plan to spur productivity;
  - investing in science, new technologies and knowledge; and
  - supporting skills development and knowledge dissemination.

What Does the Graph Mean?

- Improving our quality of life and standard of living requires production improvements. Resources remain important to Canada's economy due to production gains.
- Six of Canada's top ten leaders in productivity growth from 1984-98 were resource based.
- More recently, the pulp and paper sector has seen productivity growth of 2.5% per year over the 1993 to 1998 time period, reflecting significant capital investments in the early 1990s.
- In 1998, five of the ten leaders in GDP per hour of work were resource industries.
- Canada's natural resources sector provides a steady and solid foundation of high paying, highly skilled jobs.
- For the period 1998-99, overall employment in the resource industries increased by 15,000.
- GDP per employee was high at an average of 96,000 per employee

Next Steps

- More knowledge will be provided by ResSources/NRCan's On-line initiative.
- Our findings will be used to improve the work opportunities for Canadians in rural, northern and Aboriginal communities.
- NRCan will continue to provide accurate employment and productivity data for the resource industries, reviewed by subject matter officers familiar with the industry.
- Productivity rates for the resource industries will continue to be calculated using the sectoral comparison data generated by NRCan.
- NRCan will continue to advance work on innovation, science and resource-related technologies that will improve productivity.
- Information for resource-related industries will be added to the performance indicators when the data is available.

3. Strategies to manage the environmental impacts of natural resource development and use.

Objectives	Performance Indicators
3.1 Canada addressing its international Kyoto commitment to reduce greenhouse gases.	**3.1.1** a) GHG emissions compared to Kyoto protocol; and b) GHG emissions to GDP ratio compared to other countries.* **3.1.2** Trends in use of renewable energy. **3.1.3** Trends in energy efficiency.* **3.1.4** GHG emissions from federal operations. **3.1.5** Progress towards the identification of impacts and adaptation measures.
3.2 Scientific research, technologies and stewardship practices that reduce environmental impacts, conserve biodiversity, and increase the efficiency of resource development and use.	**3.2.1** Environmental influence of NRCan's science, technology and stewardship practices.
3.3 Canada's environment safeguarded from the risks associated with natural resource development and use.	**3.3.1** Progress towards addressing hazards associated with resource development and use.

* Performance information on the above indicators is included at the end of the sub-section, on pages 36-38.

GLOBAL Climate Change LES CHANGEMENTS climatiques

The Climate Change Challenge – Under the 1997 Kyoto Protocol on global climate change, Canada committed to reducing its greenhouse gas (GHG) emissions to six percent below the 1990 level by the period 2008-2012. NRCan has primary responsibility for domestic implementation of climate change initiatives. It plays a leadership role for Canada in addressing this challenge, working in partnership with other federal departments, the

What did we accomplish?

provincial, territorial and municipal governments, communities, utilities and the private sector, through a broad set of policies, programs, science and technology and international work. A summary of NRCan's accomplishments, to date, in addressing the climate change challenge is shown on pages 36 and 37.

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Energy Efficiency Helps – Energy efficiency is an important element of Canada's climate change strategy. About 80 percent of

Canada's total greenhouse gas emissions are in the form of carbon dioxide mostly from the use of fossil fuels. In Canada, all levels of government have programs to reduce the market barriers to energy efficiency and to accelerate the development and adoption of more energy-efficient technologies. In addition to reducing GHG emissions, these measures are helping to foster the development of innovative technologies and processes that will lead to new economic opportunities for Canada. Additional details on NRCan's energy efficiency achievements can be found on pages 37 and 38.

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Promoting Energy Science and Technology **–** NRCan has coordinated federal energy science and technology activities in Canada for more than 20 years, mainly through the Program of Energy Research and Development (PERD) (http://www.nrcan.gc.ca/es/oerd/perdmain.html).

PERD ($57.5 million/year) is the vehicle for horizontal delivery of federal energy R&D through partnerships both within NRCan and with ten other participating federal departments. In 1999, NRCan implemented a results-based management system to incorporate performance measurement and reporting of the work conducted with PERD funds. NRCan also used impact evaluations and assessments to make decisions about resource allocation, including third-party advice and review to ensure that such decisions are unbiased and reflect energy R&D needs.

Within the restructured PERD, NRCan targeted six strategies, one of which is "cleaner transportation for the future". Canada's transportation sector is almost entirely dependent on the combustion of petroleum products for its energy source. For this reason, it is a significant contributor to atmospheric pollutants, including 10-14 percent of overall particulate matter (Pollution Data Branch, Environment Canada 1996). New technologies such as fuel cells, and electric and hybrid vehicles are at various stages of development with PERD support, but will need some time before they impact urban air quality. In recent years, new technologies such as catalytic converters, 3-way catalysts, oxygen sensors, electronic fuel injection, combustion chamber re-design and fuel modifications have contributed to reduce emissions from conventional vehicles. NRCan worked with Transport Canada, Environment Canada, the National Research Council, Health Canada and industry to bring change and assess these new technologies in the Canadian cold weather environment. As an example of such collaboration, diesel emissions from oil sands derived fuels have been assessed and will be used to define future diesel specifications.

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Lightweight Materials Cut Fuel Consumption – 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. In this regard NRCan coordinates the Canadian Lightweight Materials Research Initiative (CLiMRI), a government/industry partnership aimed at developing materials and manufacturing processes for fuel efficient vehicles. CLiMRI is led by an Industry Steering Committee supported by a government secretariat. CLiMRI's technical focus is weight reduction in ground transportation. With industry targets of up to 40 percent weight reduction and a North American market of 12 million vehicles per year, there is a large potential for increased fuel economy. And with less fuel consumed comes less urban smog, cleaner air, and reduced emissions of carbon dioxide, the most

prevalent greenhouse gas. As a rule of thumb, for a lifetime of a typical vehicle, every kilogram of weight reduction will result in 17-20 kg fewer carbon dioxide emissions. Thus, one of CLiMRI's two principal goals is to reduce greenhouse gas emissions through improved vehicle efficiency.

Mining makes it happen...

Its second principal goal is to improve the competitive position of Canadian operations involved in the vehicle manufacturing chain. This sector is a major employer providing between 250,000 and 300,000 jobs in Canada. And parts manufacturing technology is changing rapidly, driven not only by R&D to combat global warming and atmospheric pollution, but also by developments in the computer and communications fields. Canada needs an innovative, well-funded research initiative to continue to develop technology for use by Canadian companies in the supply chain for automobile production. A particular strength of CLiMRI is its ability to stimulate working partnerships along the entire production chain, thereby greatly improving the chance of successful technology transfer. The CLiMRI research program started in April 1999 with an initial suite of 11 projects. Scientists are studying lightweight materials, such as aluminum and magnesium alloys, and manufacturing processes for their use in parts production. In addition to NRCan, the National Research Council and five universities perform the research, supplemented by the work of private sector R&D centres. Progress on all projects is on track. PERD contributed $850,000 toward CLiMRI's work, of which $450,000 is supporting projects at NRCan. Additional financial support and in-kind contributions from industry have brought the total value of the work to about $2.2 million. Additional information regarding CLiMRI is available at http://climri.nrcan.gc.ca.

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Improving the Health and Productivity of Canada's Forests – The health of Canada's forests and their productivity can be substantially increased by introducing attributes that would enable them to adapt to disturbances such as forest damaging insects, competing vegetation, and damaging molds. Canada has made great strides in its forest research and development efforts to increase the vigor and growth rate of trees in various forest science fields including genetic modification, plant propagation, and cryopreservation techniques (frozen storage at the temperature of liquid nitrogen); the development and use of biological alternatives to chemical pesticides and herbicides; and in the development, transfer and implementation of sustainable forest management practices.

For example, in collaboration with BC Research Inc. and Cellfor Inc., a plant tissue cloning method was developed for western white pine and other pine species. This method is also being used for white, black, and red spruce, tamarack, European larch, hybrid larch, Sitka spruce, Douglas fir and Loblolly pine. This cloning method allows for the production of superior seedlings from one seed for planting in about 18 months (in the case of spruce) where traditional vegetative breeding techniques could take seven or more years to achieve full production.

NRCan also developed methods for the cryopreservation of conifer culture lines developed through cloning. These tissue culture lines can now be safely stored until such time they can be properly integrated into the conventional tree breeding cycle.

In collaboration with the Ministère des Ressources naturelles du Québec, NRCan, using conventional tree breeding methods, is field-testing white spruce and pines having superior qualities from the best trees (known as plus trees). Productivity gains of 15 percent and 25 percent are expected to be realized for white pine and white spruce respectively.

In collaboration with B.C. Hydro and MycoLogic Inc., NRCan successfully developed a bioherbicide using a fungus for the control of unwanted hardwood brush in British Columbia. Currently at the pre-commercial stage, this technology is poised to become Canada's first alternative to chemical herbicides for brush control for use in the development of community level vegetation management strategies.

From a forest management perspective, NRCan continued to study the environmental effects of clearcut harvesting on site productivity and developed techniques compatible with sustainable forest management practices including ecosystem and landscape management. The Montane Alternative Silvicultural Systems initiated in 1992, has demonstrated that forestry can be done differently in old-growth temperate forests on the Pacific coast. As a consequence, in June 1998, MacMillan Bloedel (now Weyerhauser Company Limited) announced its intention to phase-out clearcutting in British Columbia's coastal forests. As well, findings from a collaborative study comparing stages of forest development from regeneration to old growth, are being used to guide alternative, non-clearcut harvesting plans on privately owned lands.

NRCan has already developed a number of models of natural disturbances, including fire and pest behavior, species succession, and ecosystem maintenance to support on-the-ground forest management decision-making. In 1999, societal indicators for defining and monitoring rural community stability were developed to better understand the dynamics of economic boom and bust cycles and to understand the roles forests play in making rural communities less susceptible to these cycles. Other models will likely be developed in the future to account for multiple values in resource use, including timber, recreation, and biodiversity.

From a policy perspective, Canada's Biotechnology Strategy was revamped in 1998 to ensure that the expanding field of biotechnology will continue to be properly regulated to respect Canadian safety requirements, values and interests. This new policy framework also incorporates the social, ethical, health, environmental and regulatory considerations Canadians deem important.

With respect to the Canadian Forest Service (CFS) S&T Networks, an organizational review concluded that the networks are an effective approach for delivering CFS science that may be further enhanced by the alignment of the roles, responsibilities, accountabilities, and the organizational structure to support the work of the scientists. Detailed information on each of NRCan's ten Forest Science Research Networks can be accessed through the following web site: http://www.NRcan.gc.ca:80/cfs/proj/sci-tech/index_e.html

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Long-term Management of Radioactive Waste – In Canada, there are three categories of radioactive waste: low-level radioactive waste, nuclear fuel waste, and uranium mine and mill tailings. The federal government is moving forward on all fronts to advance radioactive waste management as part of its commitment to safeguarding Canada's environment.

In1996, the Government of Canada announced its Policy Framework for Radioactive Waste which made the federal government accountable for the disposal of radioactive waste, in a safe, environmentally-sound, comprehensive, cost-effective and integrated manner.

Nuclear fuel waste continues to be stored safely at reactor sites. Following the Government of Canada's December 1998 Response to the Nuclear Fuel Waste Management and Disposal Concept Environmental Assessment Panel, waste producers and owners are expected to set up a waste management organization to manage their wastes in the long-term and carry out the next steps under federal government oversight. Over the past year, NRCan officials developed recommendations on how to implement federal oversight, including the development of new legislation.

For low-level radioactive waste, the federal government made positive strides this year in the management of wastes for which it has some responsibility. In Ontario, NRCan officials worked to assist Port Hope area communities develop their own conceptual approaches to the long-term management of the area's low-level radioactive wastes. Cabinet reviewed the communities' proposals and gave the Minister a negotiating mandate to develop legal agreements with the communities that would establish the terms and conditions under which the communities would host long-term radioactive waste management facilities and permit a cleanup of the local contamination. The project is estimated to cost roughly $230 million. Negotiations began in January 2000 and continue. On the west coast, in Surrey, British Columbia, the Minister agreed to implement recommendations of the Surrey Siting Task Force which resulted in the removal and disposal of thorium-contaminated soil and slag from two industrial sites in Surrey. The cleanup work was carried out by NRCan at a cost of about $2.5 million.

With respect to uranium mine and mill tailings, the requirement for financial guarantees to cover the decommissioning costs of operating uranium mine sites in Canada has been firmly set in place. In Ontario, owners of uranium mines have financed or are in the process of financing the decommissioning of their sites, and a Canada-Ontario Memorandum of Agreement is in place to share these costs in the unlikely event that any of the sites are abandoned. In Saskatchewan, a similar federal-provincial agreement is being considered for abandoned uranium mine sites in the northern part of the province. In the Northwest Territories, NRCan is assisting DIAND in ensuring the proper decommissioning, as necessary, of historic uranium mine sites.

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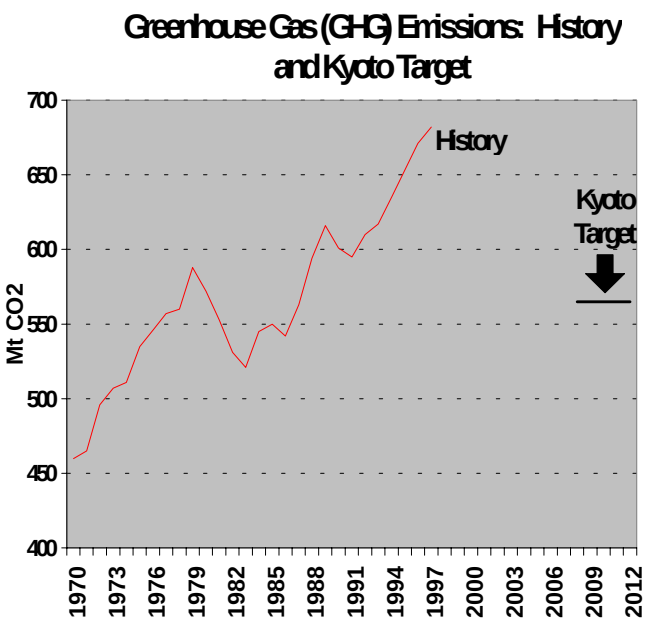
Goal 3, Objective 3.1 - Canada addressing its international Kyoto commitments to reduce greenhouse gases.
Indicator 3.1.1a): Greenhouse Gas Emissions compared to Kyoto Protocol.
Target: Reduce GHG to 6% below 1990 level between the year 2008 and 2012.
As part of the Government of Canada's plan to address climate change, the Climate Change Action Fund (CCAF)* was established in the 1998 federal Budget and renewed in Budget 2000. The CCAF invests in four components: supporting early and meaningful actions to reduce GHG emissions; promoting better understanding of the science of climate change, its impacts and adaptation measures; creating broad awareness of the challenges; and supporting foundation analysis work, including the preparation of a National Implementation Strategy (NIS). Over the past 18 months, 16 issue tables and groups consisting of more than 450 experts from the private sector, academia, interest groups and all orders of government, have identified challenges, opportunities and best practices relating to climate change. Using reports from these groups, the Government of Canada is working with other governments and Canadians to finalize the Strategy. In the interim, in January 2000, energy and environment ministers announced a baseline protection initiative to address concerns of Canadian industries that want assurances from governments that early actions to reduce GHG emissions would not be penalized under future policies. New investments have been targeted in Budget 2000, including the Sustainable Development Technology Fund, funding for the Canadian Foundation for Climate and Atmospheric Sciences and measures to help municipalities take action. In March 2000, the federal and provincial Ministers of Energy and the Environment held a joint meeting to discuss how to advance the NIS. They agreed in principle to proceed with the First Business Plan and to discuss a draft at their October meeting.



NRCan's Contribution

- Technology Early Action Measures – TEAM accelerates the pace of deployment of new, more energy efficient, technologies. Investments of $55M over 3 years have leveraged more than 10 times that amount from partners. Projects to date have the potential to reduce GHG emissions by 50Mt by 2010.
- Science Impacts and Adaptation – The Prairie Adaptation Research Cooperative in Regina was formed to better understand the effects of climate change on regions and on human activity.
- Public Education and Outreach – This initiative has been co-chaired by NRCan and Environment Canada. NRCan continues to co-manage the public education and outreach component of the CCAF to improve awareness and understanding of climate change and encourage appropriate action.
- Foundation Analysis – Canada's Emissions Outlook update was published, providing a reference scenario for the multi-stakeholder consultations and strategy.
- Remote sensing and ground measurement techniques were applied to determine Canadian forests' ability to absorb atmospheric carbon.
- For more information, see www.climatechange.gc.ca

What Does the Graph Mean?

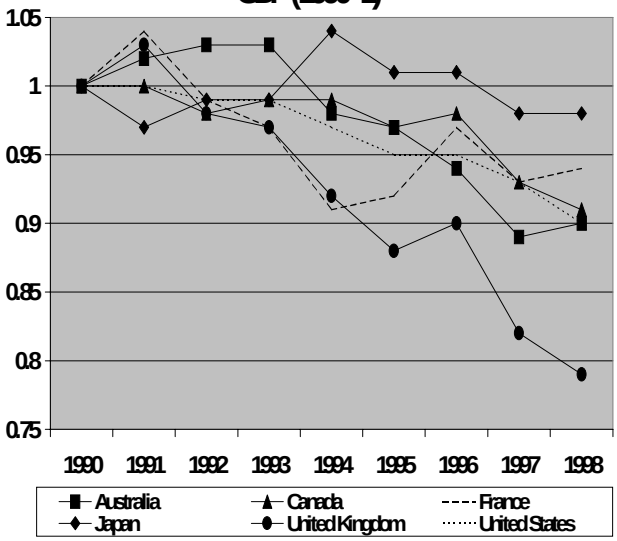
- As the economy and Canadian population grow, so too does energy use and hence GHG emissions. Dips in the graph are caused mainly by recessions, e.g. 1982.
- The Kyoto target is shown by the 565 Megatonnes of carbon dioxide (CO_2) for the 2008-2012 period, a level last achieved in 1987.
- Meeting this target is of particular importance to NRCan as some 80% of GHG emissions are energy-related.
- Canada has made progress in bringing emissions under control, even as the economy and population expand.
- Achieving the Kyoto target in a way that will not hamper economic growth is a significant challenge.

Next Steps

- The Government of Canada is working towards the finalization of a National Implementation Strategy.
- NRCan continues to work with Environment Canada and Foreign Affairs and International Trade Canada to develop Canada's positions on key issues for negotiation at the 6th Conference of the Parties (CoP6), and particularly, the framework for a *ratifiable package*, e.g., the elaboration of efficient and unfettered Kyoto market-based mechanisms, the comprehensive inclusion of carbon sinks and the engagement of all major developed and developing economies in the implementation of the Protocol.

*Contribution in excess of $5 million/year. For additional details on the Climate Change Action Fund, please see http://www.climatechange.gc.ca/english/html/fundindex.html

Goal 3, Objective 3.1 - Canada addressing its international Kyoto commitment to reduce greenhouse gases.
Indicator 3.1.1b): GHG emissions to GDP ratio compared to other countries.
Target: Reduce carbon dioxide emissions per GDP
The Government of Canada annually invests approximately $200 million towards research, technology development and deployment, programs and public education to address climate change. Improving energy efficiency in buildings, transportation and industry, and increasing the use of renewable energy minimizes negative environmental impacts, generates economic activity and helps Canada meet its climate change commitments. An evaluation study of the Federal Buildings Initiative (FBI) recommended that NRCan should continue to deliver the FBI in its present format, but with a renewed and strong emphasis on its leadership and facilitation role. Canada compares favorably with other countries with respect to performance to date on GHG emissions reductions, but in order to further reduce emissions, Canada must continue to reduce the carbon intensity of its economy. NRCan contributes to this in a number of ways (see below). For example, Canada's *Energy Efficiency Regulations* now apply to energy-using products that collectively account for 73% of residential energy use. The Regulations set out minimum energy performance standards for more than 20 residential and commercial products, and Energuide labelling requirements for 7 major household appliances. More achievements and progress indicators on improving energy performance in Canada are found in NRCan's Report to Parliament under the *Energy Efficiency Act**, at http://oee.nrcan.gc.ca/english/publications/reports.cfm.
Additional information on technologies that help reduce emissions and improve energy efficiency can be found at http://www.nrcan.gc.ca/es/etb/etbhome.htm .



NRCan's Contribution

Buildings
- NRCan established and managed the successful Green Building Challenge, an international project to develop and test new methods to assess the environmental performance of buildings.
- With partners in the private sector, NRCan developed the world's most advanced biomass-fired pellet stove.

Transportation
- NRCan raised awareness on more climate-friendly vehicles and fuels by organizing and sponsoring events such as the Electrathon, the Future Car Challenge, Sunrayce and the Ethanol Vehicle Challenge.
- NRCan helped develop technology to determine the cetane level of diesel fuel, earning it a Federal Partners in Technology Transfer Award.

Industry
- NRCan field tested a gas turbine operating on a fuel with significantly lower emissions. Since power generation accounts for about 20% of GHG emissions, the potential for this new process is enormous.
- NRCan transferred technology to be used in 45 pulp and paper mills that has the potential to reduce water consumption by 80% and CO_2 emissions by 25,000 t/y.

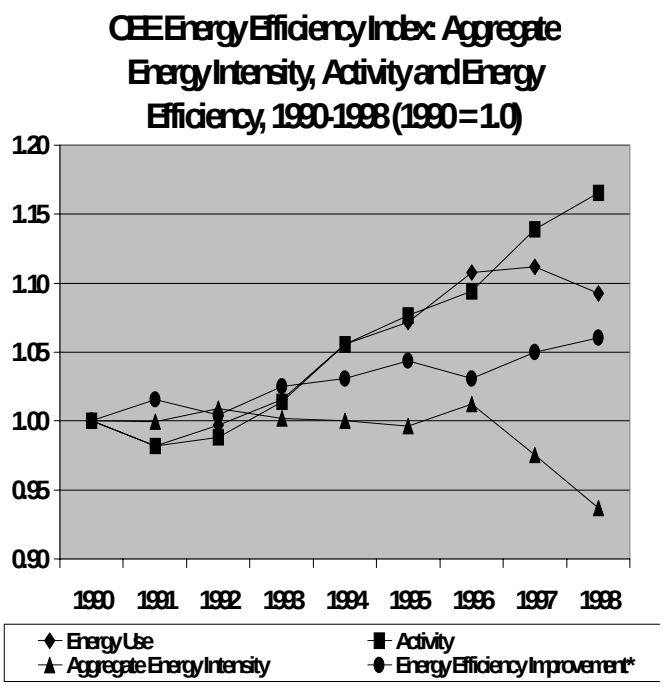
What Does the Graph Mean?
- This chart compares the carbon efficiency (i.e. ratio of GHG emissions to economic output) of six OECD industrialized countries.
- If a country's line goes up, the emissions intensity of the economy performance is worsening.
- Canada shows a steady increase in carbon efficiency over time, comparing favorably to four of the five other countries. Only the U.K. has performed better, mainly as a result of a switch from coal to natural gas for electrical generation.
- Canada's improving emissions performance is the result of switching to less carbon-intensive fuels, and greater energy efficiency.

Next Steps
- NRCan continues to put strong emphasis on increasing energy efficiency throughout the economy.
- NRCan also works to promote the use of renewable energy, and has committed to reporting on trends in this area in the 2002 departmental performance report.
- NRCan's Energy Technology Futures initiative, which contributes to climate change awareness and mitigation strategies through the gathering and dissemination of information on future energy scenarios, is informing Canadian and international agencies about strategic directions and developments with regard to possible energy futures and responses.

*Energy Efficiency and Alternative Energy programs, reflecting a contribution in excess of $5 million/year.

Goal 3, Objective 3.1 - Canada addressing its international Kyoto commitment to reduce greenhouse gases.
Indicator 3.1.3: Trends in energy efficiency.
Target: Improve energy efficiency

As part of its reporting obligations to Parliament and as part of the development of the Department's Performance Measurement Framework, NRCan committed to developing performance indicators for energy efficiency. These indicators, as well as changes in energy efficiency, have been determined in all five end-use sectors (residential, commercial, industrial, transportation and agriculture) and aggregated into a single index of energy efficiency, the OEE Energy Efficiency Index. This index is to be released at the 2nd annual Energy Efficiency Conference, Trade Show and Awards, October 10-12, 2000. "Energy Efficiency Trends in Canada, January 2000" (http://oee.nrcan.gc.ca/english/publications/reports.cfm) provides an updated overview of trends in energy efficiency, secondary energy use and associated CO_2 emissions in the five major end-use sectors from 1990 to 1998. Data collection and analysis will assist policy-makers in developing more effective responses to climate change and sustainable development issues.



NRCan's Contribution

- Several factors have contributed to saving energy. Among these are the efforts of NRCan's many initiatives aimed at moving the market toward improved energy efficiency. These 15 initiatives collectively targeted all energy consumers and emphasize partnerships and economic investments.
- For example, the Commercial Buildings Incentive Program (CBIP) offers support for the design of new buildings that are constructed to be at least 25% more efficient than the Model National Energy Code for Buildings. This financial incentive helps to offset the incremental cost associated with designing energy efficient buildings. As of March 2000, 42 buildings were covered by CIBP agreements involving $1.97 million in financial incentives.

What Does the Graph Mean?

- In order to isolate and relate trends in energy efficiency, a factorization methodology was used to attribute the change in energy use from 1990 to 1998 across four factors: activity, structure, weather and energy efficiency.
- Secondary energy use increased by 9.2%.
- The aggregate activity (GDP) increased by 16.6%.
- Aggregate energy intensity (E/GDP) decreased by 6.3%.
- The OEE Energy Efficiency Index improved by 6.0%.

Next Steps

- As a key element in Canada's response to the climate change issue, NRCan's programs aim at improving energy efficiency in all sectors of the Canadian economy. In addition, NRCan has established the National Energy Use Database to improve our understanding of where and how energy is used in Canada. It provides information to track progress, improve Canada's analytical capability and identify opportunities to further improve energy efficiency.
- NRCan is heavily involved in the consultations and analysis being undertaken to follow up on the work of the 16 issue tables established under the National Climate Change Process.

4. Safety and security in the natural resources sector.

Objectives	Performance Indicators
4.1 Canadians safeguarded from natural hazards.	**4.1.1** Impact of NRCan's S&T on the identification, mitigation and response to natural hazards.*
4.2 A national framework for spatial positioning, mapping and boundary maintenance.	**4.2.1** User satisfaction with aeronautical charts, the Canada Lands Survey System and the Canadian Spatial Reference System.
4.3 Safe use of explosives and pyrotechnics.	**4.3.1** Accident and incident rate in the explosives and pyrotechnic industries in Canada.
4.4 Enhanced safety and security in Canada's natural resources sector.	**4.4.1** Impact of regulatory frameworks for energy transmission, offshore development, and Canada's uranium and nuclear industry.

* Performance information on this indicator is included at the end of this sub-section, on page 43.

What did we accomplish?

Natural Hazards – Natural disasters occur regularly in Canada and in the rest of the world. These can have devastating effects on our livelihood. They include earthquakes, floods, landslides, shifts in permafrost distribution, tornadoes, wildfires and avalanches. The Department plays an important role in natural hazard monitoring, assessment and research. Its accomplishments are not only about reporting how many observations were made on these unfortunate incidences, but to contribute to mitigation policies, information services and response to emergencies and disasters. That is why the Department continues to demonstrate its leadership in providing appropriate information and recommendations to provincial, national and international agencies and the Canadian public that can lead to better awareness, health and safety policies, and building codes. Additional details on natural hazards can be found on page 43.

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Addressing Burning Issues Through the Development of Fire Management Information Systems – Canada's world class forest fire management information systems have been indispensable in reducing the more than $1 billion in annual losses in tourism, human habitat, timber and wildlife caused by forest fire. Since the area burned on a national scale is about equal to the area harvested each year, fire management systems are essential for provincial and territorial fire agencies to protect lives and reduce the

number of hectares burned. Therefore, timely and accurate forest fire danger information is needed to make sound fire and forest management decisions at the local level.

firefighter at work

Based on over 60 years of research, NRCan, in cooperation with fire management agencies, has developed the Canadian Forest Fire Danger Rating System (FDRS) which uses weather, fuel and topographic data to rate the potential for forest fire ignition and to predict forest fire behavior. Fire management agencies integrate information from the system in their strategic and tactical decision making processes at the ground level. The system is increasingly being used by forest companies, environmental scientists and other researchers to evaluate the role and impact of fire on forest ecosystems.

NRCan also produces and disseminates national fire danger maps on a daily basis during the fire season. These maps are used by fire management agencies to determine their fire fighting resource needs and by the Canadian Interagency Forest Fire Centre to facilitate interagency sharing of forest fire resources. This fire information system has received considerable international attention and has been adapted for use in Florida, Alaska, Mexico, New Zealand, and the Association of South East Asian Nations.

NRCan researchers also developed a prototype Wildfire Threat Rating System (WTRS) that advances the FDRS by incorporating spatial information. Using a prototype produced for the McGregor Model Forest in B.C, the WTRS provides a repeatable means of integrating and analyzing key factors that contribute to the threat of forest wildfires. When combined with NRCan's Geographic Information System, it allows resource managers to factor in: the effect of management actions on the threat of wildfires; potential impact on forest resources; and options to reduce the probability of wildfires.

The WTRS also provides assistance in pre-suppression planning in four areas – risk of ignition; values to be protected; suppression capability; and likely fire behavior. These are assessed and mapped separately, and combined to provide an overall fire threat rating. The WTRS will form part of NRCan's developed Spatial Fire Management System allowing fire managers to conduct threat assessment more easily. As well, incorporating the WTRS into landscape management planning will assist resource managers with decision-making and lead to a reduction in wildfire threat that will help save lives, property, timber supplies and other forest values.

More information on NRCan's fire management initiatives can be found at the following web site address:

http://www.fms.nofc.cfs.nrcan.gc.ca/index.html

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Aeronautical Charts - A Must for Canadian Aviation – Aeronautical charts are crucial for safe air transportation. NRCan produces and distributes these charts to Canada's navigation community as part of its mandated responsibilities. Since April 1999, the Department has produced 14,825 sets of charts making them a government best-seller.

In addition, the conversion of Air Traffic Controller charts to a digital format has made it easier to manage air traffic in major Canadian airports.

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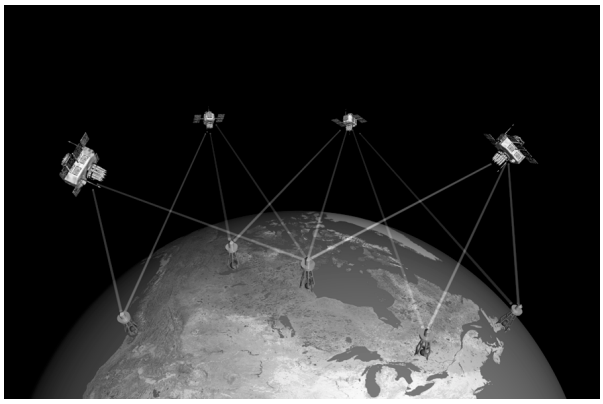
Space Age Era – The way we move people, goods and information, build communities, manage the environment, predict the weather and natural disasters, and respond to emergencies are all important issues addressed by NRCan's significant involvement in the Global Positioning System (GPS).



The reference framework for position and navigation is shifting from the ground to the sky. NRCan uses GPS satellite tracking stations to provide for precise survey and real-time positioning needs.

The GPS is a constellation of satellites whose signals to Earth have enabled a revolution in the way we live and work. Originally designed as a military navigation system, Canadian firms have responded to the phenomenal potential of GPS applications by developing products, services and expertise in a wide range of areas including: transportation, infrastructure development, agriculture and resources, environmental applications, and scientific applications.

Now GPS users can look forward to enhanced accuracy in real time with GPS Corrections, which is derived from the GPS tracking stations of the Canadian Active Control System. NRCan has made significant advances in establishing the basis for nation-wide real corrections of GPS positioning. A public sector initiative, led by British Columbia and Ontario will provide free and open access to GPS Corrections from coast to coast and beyond by 2001. This initiative will serve as an infrastructure for the emerging wireless mobility era of information-based applications.

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Burning Questions about Explosives – On August 5, 1998, a truck loaded with 18 tonnes of blasting explosives crashed into a rock cut on the Trans-Canada Highway at Walden (near Sudbury), Ontario. The crash was immediately followed by an extensive fire, and after approximately 35 minutes the explosives detonated. Fortunately, the area had been evacuated and there were no injuries, although property damage and falling debris were recorded as far away as three kilometres. The highway was closed for ten days during cleanup, investigation and subsequent repair activities.

NRCan is the federal government's primary source of expertise on explosives regulations and technology. In that context, NRCan is playing a key role in the accident investigation of the Walden truck explosion. NRCan, in collaboration with Transport Canada, the Ministry of Transport of Ontario and the

Ontario Provincial Police, conducted the on-site investigation to assess the post detonation effects of the tractor-trailer explosion. The resulting data will assist in determining the recommended safe evacuation distances for emergency response guides involving explosives-laden vehicles.

A testing program was carried out by NRCan's Canadian Explosives Research Laboratory involving samples of the explosives recovered from the site as well as fresh samples from the lots involved in the explosion. The results confirmed that the explosives met specifications, that is, the chemical composition of the explosives, their mechanical sensitivity, thermal properties and explosion sensitivity were in line with the manufacturers' declared values and values expected from blasting explosives. As well, the results confirmed that the classifications used for shipping purposes were correct.

Although most modern commercial explosives usually burn harmlessly, they may detonate when involved in an intense fire. In an attempt to better understand the behaviour of explosives in fires, and thus to determine what caused the Walden truck explosion, an extensive experimental program is underway. Development of the work for this program is being done in cooperation with Transport Canada and with guidance from explosive manufacturers/transporters. In the past year, NRCan has conducted large scale explosives burning tests at National Defence Canada's Petawawa facilities and at a private test site in Sharbot Lake, Ontario. Phase I of the three-phase program was completed in March 2000 and indicated that without confinement, it is unlikely that a pile of burning ANFO, one of the explosives involved in the accident, will make the transition to detonation in the time available before its consumption by the fire.

This experimental program will aid in the development of improved transportation practices for the explosives industry by determining whether there are conditions under which an increased level of safety related to the transport of explosives could be attained. For example, could public or worker safety be improved by reducing the maximum amount of blasting explosives that may be transported in one truck? Implementation of this type of measure would result in increased costs associated with such activities as mining, pipeline development and construction. Therefore, to ensure that regulatory requirements do not unnecessarily increase costs to or reduce competitiveness of Canadian industry, any regulatory changes must be based on sound scientific evidence of a meaningful increase in safety. Regulators at NRCan and Transport Canada are collaborating on the accident investigation to determine which regulatory changes, if any, are appropriate.

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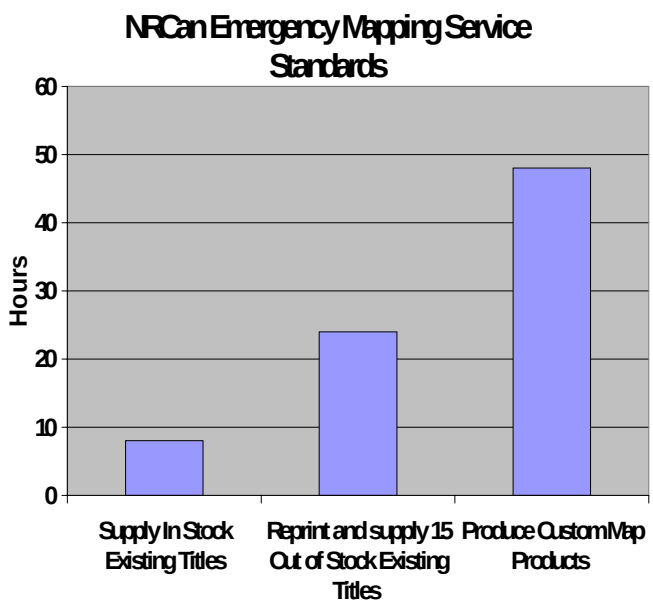
Goal 4, Objective 4.1 - Canadians safeguarded from natural hazards.

Indicator 4.1.1: Impact of NRCan's S&T on the identification, mitigation and response to natural hazards.

Target: Maintain or improve upon the standard.



NRCan's Contribution

- In September 1999, NRCan participated in VALIDEX, the government-wide exercise to test the readiness of federal departments to respond to emergencies that may arise. NRCan emergency mapping response met all of the standards of this exercise.
- In a national emergency, the maps, which NRCan publishes, can help save lives and protect property by guiding the efforts of rescuers. For example, during the ice storm of 1998, NRCan's topographical maps were used by military and civilian emergency organizations to coordinate responses.
- In collaboration with Emergency Preparedness Canada and the Department of National Defence, NRCan ensures mapping resources are available for emergency response planning and on-site tactical operations.

What Does the Graph Mean?

- The graph shows the standard that NRCan has set in which the Department can provide different kinds of maps.
- We have documented (compliant with our ISO 9001 quality management system) emergency mapping procedures that enable effective emergency response planning by the Minister of National Defence. The existing standards that NRCan has set are:
  - within 8 hours, NRCan will supply an existing set of in stock maps;
  - within 24 hours, NRCan will supply any existing set of out of stock maps; and
  - within 48 hours, NRCan will produce a customized map to service emergency requirements.

Next Steps

NRCan will explore ways to:

- confirm emergency mapping needs and technological opportunities with client agencies;
- acquire digital presses and convert paper maps to a digital format that can be reprinted on demand; and
- improve disaster management preparedness for targeted areas at high risk from events such as earthquakes, landslides and floods.

5. A department that is efficiently and effectively managed.

Objectives	Performance Indicators
5.1 Responsible use of approved resources.	**5.1.1** Employee satisfaction with NRCan management practices.* **5.1.2** Progress towards maintaining and enhancing NRCan's program integrity. **5.1.3** Savings realized from streamlining administrative processes, innovative service delivery, electronic commerce, improved facilities management, and information technology bulk purchasing and contracts.
5.2 Continuous improvements of NRCan products, services, and operations.	**5.2.1** Implementation of recommendations from audits, evaluations and other studies of NRCan management and operations.
5.3 Increased use of leading-edge environmental management tools and practices for NRCan operations.	**5.3.1** Progress of the Department's Environmental Management System towards the implementation of ISO 14000 series of standards. **5.3.2** Progress towards the implementation of environmental health and safety audits and environmental assessment evaluation of NRCan operations.
5.4 Increased waste reduction from NRCan operations.	**5.4.1** Amount of solid non-hazardous waste from NRCan operations per capita per year.
5.5 Increased efficiency of energy and other resource use in NRCan operations.	**5.5.1** Portion of fleet converted to alternative fuels.
5.6 Increased use of goods and services that are eco-efficient.	**5.6.1** Rate of purchasing by NRCan of green power.

* Performance information on this indicator is included at the end of this sub-section, on page 48.

What did we accomplish?

Over the past 12 months, NRCan has moved on multiple fronts with a view to continuously improving its management practices. Additional information on management practices is included on page 48.

Over the reporting period, the Department has been very active in keeping pace with government-wide initiatives in the areas of Universal Classification Standard, Modern Comptrollership, and the Financial

Information Strategy on which it will be compliant by April 2001. Details on modern comptrollership and other management issues can be found in the Consolidated Reporting section starting on page 49. Information on how well we are keeping our own house in order (i.e., waste reduction and increased efficiency of energy and other resource use from NRCan operations) can be found on our Sustainable Development Strategy web site at http://www.nrcan.gc.ca/dmo/susdev/

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Measurement, A Necessary Tool in the Tool Kit – The Department implemented its Performance Measurement Framework (PMF) which is aligned with its Sustainable Development Strategy and Planning, Reporting and Accountability Structure (PRAS). We believe that the PRAS, and the implementation of a revamped planning and reporting cycle, has and will serve the Department well in the preparation of better planning and reporting documents to Parliament.

The Department made a commitment, in its 2000-2001 Report on Plans and Priorities, to systematically report against all of its 36 performance indicators by 2003. NRCan is delivering on this commitment by reporting against seven performance indicators in this Departmental Performance Report. This enables the Department to inform stakeholders of progress made toward advancing the goals of Canadians and the Department related to sustainable development and good governance, and also provides a mechanism for informed decision-making with a view to continuous improvement.

In his May 2000 annual report, the Commissioner of the Environment and Sustainable Development noted the usefulness of our approach to reporting on progress toward sustainable development. In *Managing for Results 1999*, the President of the Treasury Board identified NRCan as having developed a distinct tracking process for performance measurement. Furthermore, NRCan's Performance Measurement Framework was acknowledged as a best practice model by the United States National Partnership for Re-inventing Government – led by Vice President Al Gore – in the report, *Balancing Measures: Best Practices in Performance Measurement*, August 1999.

In addition, a Conference Board of Canada supplement to the May15th, 2000 edition of Maclean's magazine, also recognized the Department as a best practice model in sustainable development reporting. To this end, and in the context of maintaining corporate social responsibility, NRCan was singled out as the only government department among private sector leaders meeting this goal.

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Striving for Excellence – The NRCan Excellence Initiative supports departmental priorities and the Department's evolving management agenda. Successful implementation of Excellence NRCan will help ensure that our management agenda is based firmly on modern management and human resources principles. NRCan has viewed its Excellence journey as a long-term commitment which will position the organization as a best-managed department within the federal government. The current three-year Excellence Plan concluded on March 3l, 2000 and produced the following results:

- implementation of NRCan Operating Principles;
- promotion of a Guide to Good Management;
- implementation of sectoral client satisfaction measures (surveys); and
- registration of thirteen ISO divisions and laboratories.

We are now working on the development of a new three-year work plan which will focus on improving management practices, client satisfaction measurement and upgrading ISO registrations to the new ISO 9000-2000 standards.

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Retention, Rejuvenation and Recruitment – Our human resources (HR) are vitally important to our ability to promote and encourage the sustainability of Canada's natural resources. In terms of advancing the federal agenda related to retention, rejuvenation and recruitment, NRCan leads a number of initiatives with science-based departments and agencies (SBDAs) to advance HR management in the S&T community. In terms of recruitment, the challenge is targeting young professionals with scientific training for recruitment in the federal public service. Having recognized this issue and the timeframes required to recruit and train young professionals, NRCan and the SBDAs are working at developing a proposed Graduate Opportunities Strategy. While the proposal is still in its developmental stages, NRCan has recently been recognized by the Treasury Board Secretariat (TBS) for its efforts. Our leadership in this initiative has been positive in bringing together federal science departments to collaborate on issues of mutual interest and to work on common solutions. Implementation of this strategy could result in the Department employing approximately 150 S&T workers. These workers will not increase the number of S&T employees over the long term.

The Scientific Management Development Program, championed in NRCan, is intended to recruit, retain and develop new S&T managers. The program, which will be implemented in 2001, has been developed by the community in partnership with the Canadian Centre for Management Development. NRCan also leads the S&T Aboriginal Working Group which is exploring opportunities to partner with Aboriginal S&T organizations to support Aboriginal students pursuing studies in S&T. These interdepartmental initiatives are the result of collaborative, horizontal management of HR S&T issues by the S&T Community. As well, the Geomatics Professional Development Program ($554 thousand annually) is an excellent example of NRCan's strategy for providing hands-on training to university graduates in various fields of geomatics and geoscience, creating an opportunity to acquire marketable skills for future employment. In the planning period,14 were recruited and 5 graduated from the program (two-year program).

As part of Phase II of La Relève, NRCan developed a five-year Retention, Rejuvenation and Recruitment (3R) strategy to address HR priorities, including fostering a representative workforce to meet the challenges of today and tomorrow. The strategy – developed at the corporate, sector and functional community level – identified priorities under five pillars: Recruitment; Employment Equity; Career Development, Learning; and Succession Planning. Some of the results to date include career planning workshops, and the development and implementation of a pilot mentoring program. The retention and development of existing employees is also taken very seriously at NRCan. For example, in the past year, we have provided training to departmental employees and assisted in the development of individual learning plans. This type of training provides our employees with the tools and support they need to take charge of their public service careers. Specific programs include participation in an Aboriginal Career Development Initiative developed by Health Canada, as well as the Career Assignment Program (CAP), the

Management Trainee Program and Aboriginal CAP.

Additionally, NRCan's 0-tolerance harassment policy responds to some of the concerns raised in the Public Service Employee Survey and stresses the importance of both prevention and early intervention. In this regard, we have presented sessions to 3,246 employees including our Regional Offices. Since the sessions have been given, the number of formal complaints has not increased; however, more situations were dealt with on an informal basis. These mandatory sessions are ongoing.

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Strengthening our S&T Capacity – As a science and knowledge-based economic department, one of NRCan's primary concerns is our ongoing capacity to deliver the science, knowledge and technology required by our legislative base.

We have undertaken an extensive strategic review of S&T capacity gaps, both current and projected over the next five years. This review has been holistic, encompassing all that is needed to deliver S&T – skills, facilities, platforms and equipment, as well as the necessary supporting infrastructure such as information technology. This initiative will lead to the development of a long-term strategy to address gaps.

With regard to the supporting real property infrastructure required to deliver on our departmental mandate and objectives, we recently received authority to draw down on $49 million, over the next five years, for critical health and safety upgrades to our aging facilities inventory. In addition, $1 million was provided for equipment replacement in our explosive research laboratory. The funding, which will address health and safety aspects, is critical to our approach of mitigating risks. Furthermore, the conducting of due diligence review of all buildings in the National Capital Region lead to the launching of a Safety and Health Special Effort in December 1999. The initiative involved a comprehensive assessment of safety, health and environmental risks and the prompt actioning of corrective measures to minimize or fully eliminate the risks.

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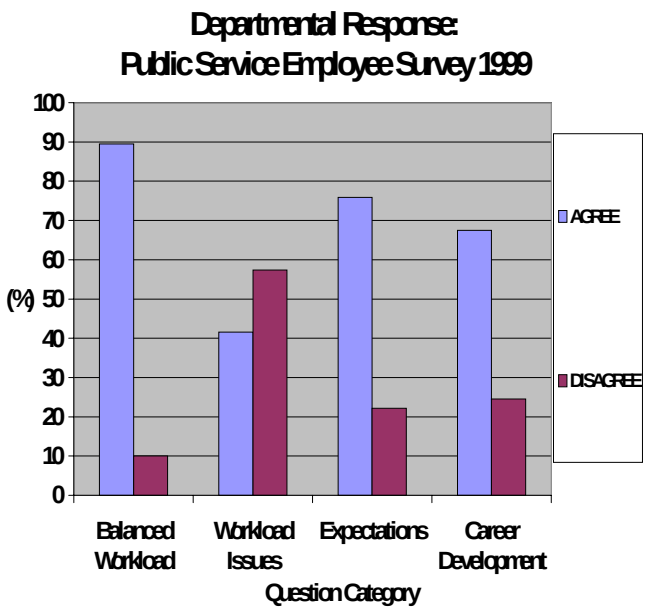
Goal 5, Objective 5.1 - Responsible use of approved resources.
Indicator 5.1.1: Employee satisfaction with NRCan management practices.
Target: Maintain or improve upon satisfaction levels.



NRCan's Contribution

- NRCan's primary goal was to use the Public Service Employee Survey to engage all employees in dialogue about their work environment.
- This survey complements three NRCan upward feedback surveys.
- Since November 1999, issues requiring action at the departmental level were identified. The issues are: workload, harassment and discrimination, career development and fairness and cynicism.
- NRCan's Deputy Minister is committed to sharing with his deputy ministerial colleagues, the work NRCan is doing in taking the Public Service Employee Survey from results into action. The Department's Public Service Employee Survey Champion is working closely with central agencies and other government departments to respond to the survey results requiring government-wide support.

What Does the Graph Mean?

- In 1999, the Public Service Employee Survey was conducted in all federal departments and agencies. The graph shown above illustrates NRCan's employee response to that survey:
  - Balanced Workload is based upon questions 5 and 10;
  - Workload Issues is based upon questions 11 to 17;
  - Expectations is based upon questions 23 to 29;
  - Career Development is based upon questions 36 and 37.
- NRCan employees' response to Public Service Employee Survey questions about flexibility to balance personal, family and work needs, as well as their current work arrangements were overwhelmingly positive.
- Responses to survey questions concerning workload highlighted that employees believe their quality of work suffered because of constantly changing priorities, lack of stability, and having to do more with less. In NRCan, only 50% of employees responded that they considered their workload reasonable, which is below the public service average of 56%.
- Departmental employees generally agreed that they know what their supervisor expects of them in the job, that they are allowed to determine how they do their job, and that they get feedback on their job performance.
- While employees responded that they are allowed to take training for their job, only 54% of respondents agree that their immediate supervisor helps them to determine their learning needs.

Next Steps

- NRCan will develop and implement an Integrated Management Agenda (IMA) in response to the issues surrounding workload. An IMA would encompass priority-setting and allocation of resources, two areas cited by employees as impacting on their quality of work.
- NRCan will continue to refine its "Guide to Good Management" to ensure the Department understands what are considered exemplary practices in all areas of management. Supervisors and managers throughout the Department will be encouraged to use this tool.
- NRCan is committed to continued implementation of its five-year Retention, Rejuvenation and Recruitment (3R) Strategy. The 3R Strategy places career development and succession planning at the forefront, by providing employees with necessary tools to advance career path and development.
- NRCan will continue to promote the benefits of alternative working arrangements to enhance employees' ability to balance their personal, family and work needs.

III Consolidated Reporting

A. Sustainable Development Strategy

Sustainable development is the responsibility of every Canadian. As advanced in the October 1999 Speech from the Throne, each of us has a part to play in building a higher quality of life for all Canadians. NRCan's Sustainable Development Strategy (SDS), *Safeguarding our Assets — Securing our Future*, continues to be a critical departmental tool for advancing change and leading the way on sustainable development.

The strategy, which was tabled in Parliament on December 10, 1997, sets out a framework to assess the Department's work in advancing change. In 1999, NRCan released *Sustainable Development: From Commitment to Action — A Report on the Progress of the Natural Resources Canada Sustainable Development Strategy* which described progress made over the first sixteen months of the three-year implementation period (December 1997 to March 1999). The report revealed that 71 of the strategy's 125 targets were achieved, with 16 ahead of schedule. The one target that was behind schedule, a reduction of the Departmental vehicle fleet size by 40 percent from 1995 figures, has now been met.

All 17 targets scheduled for completion in fiscal year 1999-2000 have been met, as well as one additional target scheduled for completion in 2000-2001. This brings the total NRCan action targets completed to date to 89, meaning that 71 percent of NRCan’s targets have been completed in the first 2 years of implementation.

One accomplishment of note is a comprehensive policy research study of the drivers, challenges and best practice applications of eco-efficiency across industry, which was led by NRCan under the Sustainability Project of the Government-wide Policy Research Initiative. Achieving the target involved the coordination and partnership of Agriculture and Agri-Food Canada, Environment Canada, Finance Canada, Industry Canada, Statistics Canada and Transport Canada, as well as the cooperation of 15 Canadian and international companies which were interviewed during the course of the study. The study has provided the federal government with an improved understanding of why leading industries are adopting eco-efficiency as part of their management systems.

Indicators of NRCan’s progress toward advancing its sustainable development goals and objectives are reported throughout Section II-D. An internal review of the strategy’s implementation indicated that NRCan has made significant progress; however, further improvements could be made to enhance the utility of its Internet-based tracking system (Sustainable Development - Action Items Management System) which facilitates the reporting of progress to staff and stakeholders. Furthermore, the review recommended that NRCan provide references to action items not scheduled for completion during the reporting period to facilitate transparency and that the accountability structures within some parts of the Department be reviewed.

NRCan is on track in meeting its commitment to work with stakeholders to ensure the sustainable development of Canada's natural resources. The complete list of action commitments and associated targets, additional information on the implementation of the strategy, as well as the reports referenced above are available on the NRCan sustainable development web site at http://www.nrcan.gc.ca/dmo/susdev/.

B. Regulatory Initiatives

NRCan has moved forward on a number of regulatory initiatives in support of worker safety in offshore oil and gas exploration, energy efficiency, and the safe manufacture and use of explosives. While not falling in the major or significant category for reporting in this document, an update on the status of each of those initiatives is available at the following web site: http://www.nrcan.gc.ca/dmo/spcb/acts/consid99_e.html.

C. Modern Comptrollership

Modern comptrollership is about using sound management practices to make better program and resource decisions. In 1999-2000, the Department launched its Modern Comptrollership initiative by assessing its capacities to identify areas for improvement and to establish a benchmark against which future work can be assessed. The results were shared with other modern comptrollership pilot departments and posted on NRCan's Internet web site at http://www.nrcan.gc.ca/css/fmb/mc/index.html. Next steps include the development of an action plan and the integration of the modern comptrollership initiative with other management initiatives in the Department to minimize overlaps and maximize the use of resources.

Over the longer term, this initiative will emphasize performance and provide managers with integrated financial and non-financial performance information, a mature approach to risk management, appropriate control systems and a shared set of values and ethics. The end result will be better managed programs and improved accountability to Parliament and Canadians.

D. Transfer Payments

During the period covered by this report, NRCan had three transfer payment programs in excess of $5 million/year. They were: (i) the Model Forest Program – $8.2 million; (ii) contribution in support of new and expanded measures under the Energy Efficiency and Alternative Energy Programs – $12.4 million; and (ii) the Climate Change Action Fund (CCAF) – $17 million.

Information against these transfer payment programs are presented as an integral part of the Department's performance accomplishment story-line in Section II-D, pages 15, 36-38.

E. Materiel Management

Given the strong interest of the House of Commons Standing Committees on Industry and Public Accounts, information is provided on the progress NRCan made on the management of moveable goods.

Through the implementation of its Fixed Assets System (FAS), which is integrated with NRCan's Government Financial System, the Department is now able to easily retrieve asset information (i.e., cost, custodian, location) resulting in improved asset management decision making.

In addition, pursuant to the Department's Assets Management Policy – crucial to the implementation of the Financial Information Strategy – the FAS tracks all assets $1,000 and above and capitalizes all assets over $10,000. It also has the capability to calculate the depreciation of capital assets. The policy also clarifies that "custodian managers are responsible to manage their assets by using the life-cycle approach that incorporates assessment and planning, acquisition, operation and use, maintenance, safeguarding, recycling and disposal".

Mission critical assets have been identified and are part of NRCan's Incident Response and Business Resumption Plan, which can be made available to interested parties on request.

F. Procurement and Contracting

A Value-for-Money audit of NRCan's contracting management in the National Capital Region and regional offices revealed that opportunities exists to improve elements of the contracting management framework and promote value-for-money within the Department.

NRCan is strengthening and promoting its contracting functions. First efforts in improving administrative processes were the hiring of a procurement and contracting manager within the Department's Financial Management Branch, an enhanced focus on providing expert advice and ongoing training to managers, and the development of tools such as handbooks setting forth the contracting accountability process.

The Department is confident that these measures will help ensure increased value-for-money, minimization of risks, and fair sharing of NRCan's business.

IV Financial Performance

Financial Performance Overview

NRCan recently shifted its reporting structure from business lines (S&T, developing federal policy and regulations, promoting Canada's international interests, knowledge infrastructure, corporate management and administration, Geomatics Canada Revolving Fund, and Sunset/Special Programs) to the goals shown in Section II of this report. One of the main repercussions of this shift in this year's report is a disconnect between textual performance reporting and financial information. The financial system has now been re-tooled and the situation corrected since April 1, 2000; therefore, this is the last Performance Report in which there will be a disconnect.

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. They represent what the plan was at the beginning of the year.
Planned Spending:	These dollar figures match those shown in Natural Resources Canada's 1998-99 Estimates, A 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 Natural Resources Canada and match the dollar figures shown in the Public Accounts for 1998-99. They represent what additional spending Parliament has approved for Natural Resources Canada to reflect changing priorities and unforeseen events.
Actual Spending:	These dollar figures match those shown in the Public Accounts for 1998-99 for Natural Resources Canada. They represent what was actually spent.

1. Summary of Voted Appropriations

Authorities for 1999-2000 - Financial Requirements by Authority (millions of dollars)

Vote	Program	1999-2000 Main Estimates	1999-2000 Planned Spending	1999-2000 Total Authorities	1999-2000 Actuals
1	Operating expenditures	407.6	431.5	455.4	**437.6**
5	Grants and contributions	62.5	78.7	140.3	**136.3**
(S)	Minister of Natural Resources - Salary and motor car allowance	--	--	--	**--**
(S)	Contributions to employee benefit plans	40.3	40.3	46.5	**46.5**
(S)	Canada-Nova Scotia Development Fund	4.2	4.2	1.2	**1.2**
(S)	Canada-Newfoundland Development Fund	5.0	5.0	2.9	**2.9**
(S)	Canada-Newfoundland Offshore Petroleum Board	1.4	1.4	1.6	**1.6**
(S)	Canada-Nova Scotia Offshore Petroleum Board	0.7	0.7	0.8	**0.8**
(S)	Payments to the Nova Scotia Offshore Revenue Account	2.0	2.0	1.4	**1.4**
(S)	Payments to the Newfoundland Offshore Petroleum Resource Revenue Fund	0.6	0.6	0.4	**0.4**
(S)	Geomatics Canada Revolving Fund	(0.8)	(0.8)	6.3	**1.1**
(S)	Nova Scotia Fiscal Equalization Offset Payment	1.0	1.0	3.1	**3.1**
	Total Budgetary	**524.5**	**564.6**	**659.9**	**632.9**
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	39.4	39.4	39.4	**39.4**
	Total NRCan	**563.9**	**604.0**	**699.3**	**672.3**

2a. Departmental 1999-2000 Main Estimates versus Actual Spending and Total Authorities by Business Line (millions of dollars) (Budgetary)

Business Lines	Operating	Capital	Grants & Contributions	Total Gross Expenditures	Less: Respendable Revenues *	Total Net Expenditures
Science and Technology						
Main Estimates	189.7	1.9	19.1	210.7	(16.7)	194.0
Total authorities	*201.8*	*0.5*	*31.5*	*233.8*	*(15.6)*	*218.2*
Actuals	**199.1**	**0.5**	**31.1**	**230.7**	**(15.6)**	**215.1**
Knowledge Infrastructure						
Main Estimates	140.8	0.9	9.5	151.2	(3.6)	147.6
Total authorities	*139.5*	*–*	*8.1*	*147.6*	*(2.2)*	*145.4*
Actuals	**136.6**	**–**	**7.9**	**144.5**	**(2.2)**	**142.3**
Developing Federal Policy & Regulations						
Main Estimates	61.7	1.2	18.7	81.6	(1.8)	79.8
Total authorities	*80.1*	*–*	*99.4*	*179.5*	*(2.5)*	*177.0*
Actuals	**77.5**	**–**	**96.2**	**173.7**	**(2.5)**	**171.2**
Promoting Canada's International Interests						
Main Estimates	11.8	0.1	0.1	12.0	–	12.0
Total authorities	*10.9*	*–*	*0.4*	*11.3*	*(0.2)*	*11.1*
Actuals	**7.8**	**–**	**0.4**	**8.2**	**(0.2)**	**8.0**
Sunset/Special Programs						
Main Estimates	18.0	–	29.9	47.9	–	47.9
Total authorities	*16.2*	*–*	*12.3*	*28.5*	*(0.1)*	*28.4*
Actuals	**12.8**	**–**	**12.1**	**24.9**	**(0.1)**	**24.8**
Corporate Management & Administration						
Main Estimates	44.0	–	0.1	44.1	(0.1)	44.0
Total authorities	*70.5*	*3.1*	*0.1*	*73.7*	*(0.2)*	*73.5*
Actuals	**67.4**	**3.1**	**0.1**	**70.6**	**(0.2)**	**70.4**
Geomatics Canada Revolving Fund						
Main Estimates	15.5	–	–	15.5	(16.3)	(0.8)
Total authorities	*22.1*	*–*	*–*	*22.1*	*(15.8)*	*6.3*
Actuals	**16.5**	**0.4**	**–**	**16.9**	**(15.8)**	**1.1**
Total						
Main Estimates	481.5	4.1	77.4	563.0	(38.5)	524.5
Total authorities	*541.1*	*3.6*	*151.8*	*696.5*	*(36.6)*	*659.9*
Actuals	**517.7**	**4.0**	**147.8**	**669.5**	**(36.6)**	**632.9**
Other Revenues and Expenditures						
Less: Non-Respendable Revenues **						4.8
Main Estimates						*4.8*
Total authorities						**14.9**
Actuals						
Add: Cost of services provided by other departments						27.6
Main Estimates						*60.2*
Total authorities						**60.2**
Actuals						
Net Cost of the Program						547.3
Main Estimates						*715.3*
Total authorities						**678.2**
Actuals						

* Formerly "Revenues Credited to the Vote"
** Formerly "Revenues Credited to the CRF"

2b. Summary of 1999-2000 Main Estimates versus Actual Spending and Total Authorities (millions of dollars) (Budgetary)

	1999-2000 Main Estimates	1999-2000 Total Authorities	1999-2000 Actuals
Operating	481.5	541.1	517.7
Capital	4.1	3.6	4.0
Grants & Contributions	77.4	151.8	147.8
Total Gross Expenditures	**563.0**	**696.5**	**669.5**
Less: Respendable Revenues	38.5	36.6	36.6
Total Net Expenditures	**524.5**	**659.9**	**632.9**
Other Revenues and Expenditures			
Non-respendable Revenues	4.8	4.8	14.9
Cost of services provided by other departments	27.6	60.2	60.2
Net Cost of the Program	**547.3**	**715.3**	**678.2**

3. Historical Comparison of Total Net Planned Spending to Net Actual Spending and Total Authorities

Departmental Planned versus Actual Spending and Total Authorities by Business Line (millions of dollars) (Budgetary)

Business Lines	1997-98 Actuals	1998-99 Actuals	1999-2000 Main Estimates	1999-2000 Planned Spending	1999-2000 Total Authorities	1999-2000 Actuals
Science and Technology	203.9	200.5	194.0	195.4	218.2	**215.1**
Knowledge Infrastructure	137.6	137.4	147.6	159.8	145.4	**142.3**
Developing Federal Policy and Regulations	66.5	79.5	79.8	79.8	177.0	**171.2**
Promoting Canada's International Interests	6.5	8.3	12.0	37.6	11.1	**8.0**
Sunset / Special Programs	24.8	15.0	47.9	48.9	28.4	**24.8**
Corporate Management and Administration	76.6	69.5	44.0	43.9	73.5	**70.4**
Geomatics Canada Revolving Fund	(0.6)	0.1	(0.8)	(0.8)	6.3	**1.1**
Total Budgetary	**515.3**	**510.3**	**524.5**	**564.6**	**659.9**	**632.9**

4. Respendable Revenues by Business Line (millions of dollars)

Business Lines	1997-98 Actuals	1998-99 Actuals	1999-2000 Planned Revenues	1999-2000 Total Authorities	1999-2000 Actuals
Science and Technology	13.2	13.2	16.7	15.6	**15.6**
Knowledge Infrastructure	3.1	3.1	3.6	2.2	**2.2**
Developing Federal Policy and Regulations	1.8	1.8	1.8	2.5	**2.5**
Promoting Canada's International Interests	0.1	0.1	–	0.2	**0.2**
Sunset / Special Programs	0.3	0.3	–	0.1	**0.1**
Corporate Management and Administration	–	–	0.1	0.2	**0.2**
Geomatics Canada Revolving Fund	15.9	15.9	16.3	15.8	**15.8**
Total Respendable Revenues	**34.4**	**34.4**	**38.5**	**36.6**	**36.6**

5. Non-Respendable Revenues by Business Line (millions of dollars)

Business Lines	1997-98 Actuals	1998-99 Actuals	1999-2000 Planned Revenues	1999-2000 Total Authorities	1999-2000 Actuals
Science and Technology	1.7	1.4	0.3	1.4	**1.4**
Knowledge Infrastructure	2.8	2.6	0.4	2.2	**2.2**
Developing Federal Policy and Regulations	8.9	7.5	2.9	7.9	**7.9**
Promoting Canada's International Interests	–	–	–	0.2	**0.2**
Sunset / Special Programs	3.8	4.9	1.2	2.1	**2.1**
Corporate Management and Administration	0.9	–	–	1.1	**1.1**
Geomatics Canada Revolving Fund	0.1	0.8	–	–	**–**
Total Non-Respendable Revenues	**18.2**	**17.2**	**4.8**	**14.9**	**14.9**

* 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.

6. Total Statutory Payments by Business Line (millions of dollars)

Business Lines	1997-98 Actuals	1998-99 Actuals	1999-2000 Main Estimates	1999-2000 Planned Spending	1999-2000 Total Authorities	1999-2000 Actuals
Science and Technology	–	–	–	–	–	–
Knowledge Infrastructure	–	–	–	–	–	–
Developing Federal Policy and Regulations	2.1	1.9	2.1	2.1	2.4	2.4
Promoting Canada's International Interests	–		–		–	–
Sunset / Special Programs	19.7	7.8	12.8	12.8	9.1	9.1
Corporate Management and Administration	–	–	–	–	–	–
Geomatics Canada Revolving Fund	–	–	–	–	–	–
Total Statutory Payments	**21.8**	**9.7**	**14.9**	**14.9**	**11.5**	**11.5**

7. Total Transfer Payments by Business Line (millions of dollars)

Business Lines	1997-98 Actuals	1998-99 Actuals	1999-2000 Main Estimates	1999-2000 Planned Spending	1999-2000 Total Authorities	1999-2000 Actuals
GRANTS						
Science and Technology	0.1	–	0.2	0.1	0.1	0.1
Knowledge Infrastructure	0.1	0.1	0.4	0.4	0.1	0.1
Developing Federal Policy and Regulations	0.2	0.7	0.1	0.1	62.8	62.8
Promoting Canada's International Interests	–	–	–	–	0.1	0.1
Sunset / Special Programs	–	–	–	–	–	–
Corporate Management and Administration	–	–	–	0.1	–	–
Total Grants	**0.4**	**0.8**	**0.7**	**0.7**	**63.1**	**63.1**
CONTRIBUTIONS						
Science and Technology	17.9	20.3	19.0	19.4	31.4	31.0
Knowledge Infrastructure	4.1	4.8	9.1	9.3	8.0	7.9
Developing Federal Policy and Regulations	15.0	11.4	16.5	16.5	34.2	31.0
Promoting Canada's International Interests	0.1	0.2	0.1	14.6	0.3	0.2
Sunset / Special Programs	22.6	1.4	17.1	18.2	3.2	3.0
Corporate Management and Administration	0.1	–	–	–	0.1	0.1
Total Contributions	**59.8**	**38.1**	**61.8**	**78.0**	**77.2**	**73.2**
Total Transfer Payments	**60.2**	**38.9**	**62.5**	**78.7**	**140.3**	**136.3**

Excludes Statutory Transfer Payments

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

Business Lines	Opening April 1st 1998	Opening April 1st 1999	New loans issued	Repayments 1999-2000	Outstanding Balance 1999-2000
Loans					
Sunset / Special Programs					
Regional Electrical Interconnections					–
New-Brunswick Electric Power Commission					–
Atomic Energy of Canada Ltd.					–
Housing	0.3	0.2	–	0.1	**0.1**
Heavy Water Inventory	10.5	9.5	–	1.0	**8.5**
Loans to facilitate the implementation of the Hibernia Development Project	132.0	132.0	–	13.2	– **118.8**
Nordion International Inc.	14.9	52.8	–	–	**52.8**
Total Loans	**157.7**	**194.5**	**–**	**14.3**	**180.2**
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	27.7	–	**40.0**
Total Investments and Advances	**179.0**	**191.3**	**27.7**	**–**	**219.0**
Total	**336.7**	**385.8**	**27.7**	**14.3**	**399.2**

* The DEVCO Working Capital Advance is not reflected in the non-budgetary amounts for the Department. Although DEVCO is included in the Minister's Portfolio, it is an Agency of NRCan and reports separately.

9. Geomatics Canada Revolving Fund Financial Summary

(thousands of dollars)	1997-98 Actuals	1998-99 Actuals	1999-2000 Planned Spending	1999-2000 Total Authorities	1999-2000 Actuals
Revenues					
Products	10,593	9,845	12,600	12,600	10,264
Services	4,158	4,433	4,900	4,900	5,290
Consulting	1,907	1,373	1,700	1,700	537
Total revenues	**16,658**	**15,651**	**19,200**	**19,200**	**16,091**
Expenditures	15,211	15,818	18,700	18,700	16,710
Profit (Loss)	**1,447**	**(167)**	**500**	**500**	**(619)**
Changes in Working Capital	207	(742)	200	200	380
Capital acquisitions	(1,771)	(517)	(200)	(200)	(891)
Other items	1,374	447	300	300	536
Cash requirements	1,257	(979)	800	800	(594)
Cash at April 1st	(1,704)	(447)	(1,797)	(1,797)	(1,426)
Cash at March 31	(447)	(1,426)	(997)	(997)	(2,020)
Year end adjustments	**(1,084)**	**(237)**			**(698)**
Cumulative Net Authority Used	**(1,531)**	**(1,663)**	**(997)**	**(997)**	**(2,718)**

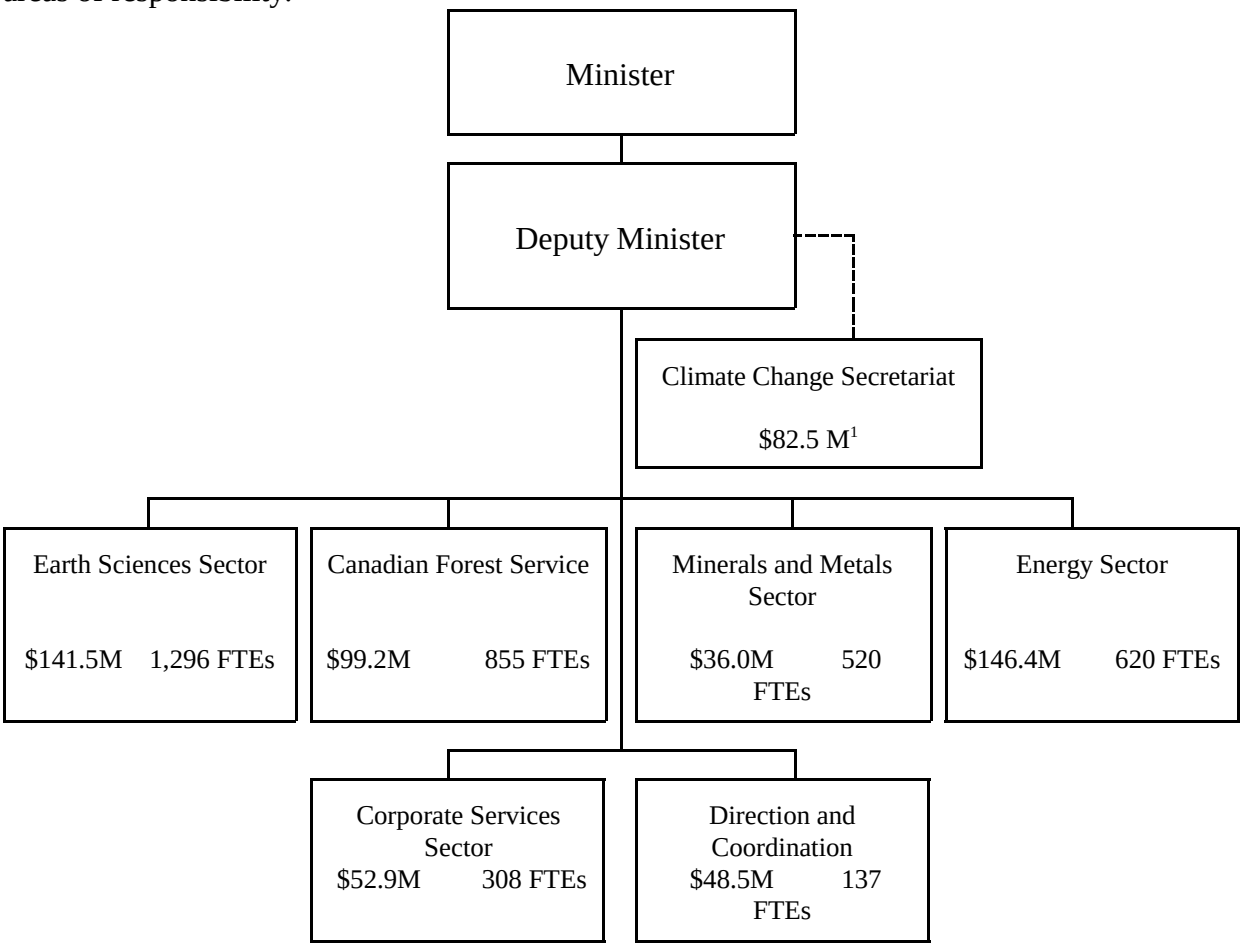
10. Contingent Liabilities (millions of dollars)

	Amount of Contingent Liability		
List of Contingent Liabilities	**March 31st 1998**	**March 31st 1999**	**Current as of March 31st, 2000**
Claims and Pending and Threatened Litigation	7.9	22.4	26.7
Total Contingent Liabilities	**7.9**	**22.4**	**26.7**

V Other Information

A. Accountability and Organization Chart

The Deputy Minister of Natural Resources Canada is accountable for the key achievements identified in this document. The Assistant Deputy Ministers and Corporate Directors General are accountable to the Deputy Minister for the delivery of the key achievements within their assigned areas of responsibility.



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 developing 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.

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[1] The Climate Change Secretariat (CCS) reports to the Deputy Ministers of NRCan and Environment Canada. The resources for 1999-2000 are allocated as follows: $60.0 million to NRCan, $15.8 million to Environment Canada and $6.7 million to Industry Canada.

The **Earth Sciences Sector** provides the comprehensive geoscience and geomatics knowledge base to support public sector activities in Canada and 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 and helps Canadians mitigate the impact of hazards such as earthquakes and toxic substances in the environment.

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 science and technology (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 ten 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, 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 central financial, administrative, information management and technology, real property and human resource services.

Direction and Coordination provides services to the Department's Executive Offices as well as strategic planning and coordination, legal, communications, and audit and evaluation services.

B. 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/english/html_
Climate Change – NRCan	http://www.climatechange.nrcan.gc.ca/english/html/index.html
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
ResSources	http://www.nrcan.gc.ca/ressources
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 (english only)	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
Canadian Geospatial Data Infrastructure	http://cgdi.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 Atlas on SchoolNet	http://atlas.gc.ca/legacy/schoolnet
National Geoscience Mapping Program (NATMAP)	http://ntserv.gis.nrcan.gc.ca/natmap
Polar Continental Shelf Project	http://polar.nrcan.gc.ca
ResSources GSC	http://rgsc.nrcan.gc.ca

Energy Sector Internet Sites:

Auto$mart 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/cicintro.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://oee.nrcan.gc.ca/neud/
Nuclear energy, uranium and radioactive waste	http://nuclear.nrcan.gc.ca:80/english.pdf
Office of Energy Efficiency	http://www.oee.nrcan.gc.ca
Office of Energy Research and Development	http://www.nrcan.gc.ca/es/oerd/index.html
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 Programme	http://www.nrcan.gc.ca/mets/aete/
Annual Conference of the Mines Ministers of the Americas (CAMMA)	http://www.camma.org
Biominet	http://www.nrcan.gc.ca/mets/biominet/
Business Climate for Mineral Investment	http://mmsd1.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/cmy/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
Minerals and Metals – A World to Discover	http://www.nrcan.gc.ca/mms/school/e_mine.htm
Minerals and Mining Statistics Division	http://www.nrcan.gc.ca/mms/efab/mmsd/
Mining and Mapping MMS Knowledge	http://mmsd1.mms.nrcan.gc.ca/maps/
Mining Taxation World	http://www.nrcan.gc.ca/ms/efab/tmrd/
Proficiency Testing Program for Mineral Analysis Laboratories (PTP-MAL)	http://132.156.144.82/ptp/main.asp
Recycling Technology Newsletter (R-Net)	http://RNET.nrcan.gc.ca

Annexes

A. A Brighter Future for Cape Breton

In January 1999, the government announced the future direction of Devco, which included a workforce adjustment package for affected workers, the privatization of Devco assets, and a $68 million Economic Adjustment Fund for Cape Breton Island, which was subsequently topped up by $12 million in October 1999, by the Nova Scotia Government.

With respect to privatization of Devco assets, the Department oversaw a sale process that included Devco engaging a financial adviser, the evaluation of bids, the recommendation of a preferred bidder and the signing of a letter of intent between Devco and a potential buyer in July 2000.

The Department also initiated Bill C-11, *An Act to authorize the divestiture of the assets of, and to dissolve, the Cape Breton Development Corporation and to amend the Cape Breton Development Corporation Act.* The Bill was introduced by the Minister in October 1999, passed by the House of Commons and the Senate in June 2000 and received Royal Assent on June 29, 2000. A final sale, will require the approval of Devco's board of directors and approval by Cabinet.

The Atlantic Canada Opportunities Agency (ACOA), the Enterprise Cape Breton Corporation and NRCan developed a strategy for the $80 million Cape Breton Island Economic Adjustment Fund. To this end, a seven-person consultation panel was appointed and began its work in November 1999. Over a fifteen-day period, the panel held nine days of hearings across Cape Breton with 214 presentations being made.

In May 2000, the final consultation panel report for the Fund was released to the public. The report emphasizes the importance of taking advantage of the growth potential of key sectors, facilitating the impact on established industries, enriching Cape Breton Island's investment climate, fostering trade to grow wealth, and the opportunities associated with the decentralization of new government services and programs. As well, the panel highlights the importance of both short- and long-term solutions, given the extraordinary economic circumstances facing Cape Breton. This report will form the foundation for the Fund, which will be implemented in the fall of 2000.

B. Sustainable Forest Management Criteria and Indicators

As the premier agency responsible for Canada's natural resources, the Department is committed to demonstrating to the world that Canada practices sustainable natural resource development. Towards this end, NRCan is establishing national frameworks consisting of economic, social, and environmental criteria and indicators (C&I) to measure, monitor and report Canada's progress towards sustainable resource development.

As Canada is steward to ten percent of the world's forests, the Department views the development of measurement and reporting tools as a prerequisite in meeting Canada's national and international sustainable resource development commitments, protocols and obligations.

NRCan, under the auspices of the Canadian Council of Forest Ministers (CCFM), released its national C&I framework in 1995 entitled, Defining Sustainable Forest Management: A Canadian Approach to Criteria and Indicators. The report, which consists of 6 criteria and 83 indicators, identifies a wide variety of forest values (criteria) that Canadians want to sustain and enhance, and describes the factors (indicators) that will be used to measure the condition of these values. Major milestones and accomplishments since the Framework's release have included:

- the 1997 release of the Criteria and Indicators of Sustainable Forest Management in Canada: Technical Report which describes Canada's capacity to report on the indicators and the parallel release of a shorter Progress Report which provides a synopsis of the technical report; and

- CCFM agreement on an Implementation Plan to report on a core set of indicators in the year 2000 and an agreement to have the 83 indicators in the framework reviewed for continued relevance.

Canada's first report on sustainable forest management using the CCFM's C&I framework entitled, "Criteria and Indicators of Sustainable Forest Management in Canada: National Status 2000", was released at the CCFM meeting August 14, 2000 in Nunavut.

Additional information on Canada's C&I initiative is available at the following web site address: http://www.nrcan.gc.ca/ccfm/pi/4_e.html.

Internationally, Canada participates with 11 other countries in developing and implementing C&I for the sustainable conservation and management of the world's temperate and boreal forests. Established as the Montréal Process in September, 1993, member countries – Argentina, Australia, Canada, Chile, China, Japan, Republic of Korea, Mexico, New Zealand, Russia, United States of America, and Uruguay – represent about 90 percent of the world's temperate and boreal forests and 60 percent of all of the forests world-wide. NRCan provides the Montréal Process liaison office. To date, major results of the Montréal Process have included:

- endorsement of the international framework for the C&I by member countries in Santiago, Chile, February, 1995 and the world's forest ministers meeting in Rome, March 1995;

- release of the Montréal Process First Approximation Report assessing each country's ability to report on the C&I to the intergovernmental Panel on Forests in February, 1997 and to the World Forestry Congress in October, 1997; and

- collaborating with the Pan-European Processes Liaison offices in exploring joint project opportunities (October 1999).

A C&I progress report entitled, Progress and Innovation in Implementing Criteria and Indicators for the Conservation and Sustainable Development of Temperate and Boreal Forests, was presented and finalized at the 8th session of the U.N. Commission on Sustainable Development in April 2000.

Addition information on the Montréal Process is available at the following web site: http://www.mpci.org.

C. Groundwater – A Vital Resource and a Health and Safety Issue

Groundwater and the Environment

Rapid global change is widely seen as one of the most serious environmental threats of the future. The public often interprets the term global change to mean climate warming when in fact, this is only part of the wider global change picture. There is growing scientific consensus that this environmental threat could cause world-wide changes in climate**,** growth of deserts, altered vegetation patterns and change in sea level caused by the melting of glaciers and ice sheets. In the last few years, changes and associated concerns about the quantity and quality of our surface and ground water has in many instances been largely ignored. Our water resources are too often taken for granted until some catastrophe occurs and solutions to address critical issues are sought.

So What?

Groundwater is an integral part of the hydrological cycle and ecosystems. The effects of diminished discharge or degraded groundwater quality on 30 percent of Canadian wetlands, lakes and rivers and the plants and wild life inhabiting these areas are hence major concerns. Water is vital to the health of Canadians, our economy and environment. A growing concern is the lack of knowledge of the current groundwater capacity in Canada and how this might be affected by climate change in the coming decades. In addition, there is a growing interest of other countries demanding the export of Canadian water. These emerging pressure requires the federal government to quantify the complete integrated hydrological cycle (surface and groundwater) of this precious Canadian resource. The effects of climate change on groundwater are poorly known, with respect to impacts on water quantity and quality, and the potential for increased reliance.

What is NRCan doing about this critical issue and how is it involved?

Natural Resources Canada has much to offer Canadians and decision-makers in terms of technical and scientific knowledge about the geology of major Canadian aquifers[1]. The Department is playing a major role in gaining an understanding of the potential for climate change impacts on groundwater, advancing groundwater databases, estimating groundwater capacity, monitoring glaciers, assessing flood risk, using water in energy, mining and forestry production, and linking water quality to naturally occurring metals in the geological environment.

[1] An aquifer is a layer of rock or soil able to hold or transmit large volumes of water.

Through partnership arrangements, NRCan has undertaken detailed investigation of aquifers to develop methods and tools to assist provincial partners on resource management. For example, geoscientific methods and tools were developed to address groundwater issues of the Oak Ridges Moraine[2] in the Greater Toronto area. The knowledge is now being applied to other critical areas in Canada facing drought and other water-related issues. NRCan has participated as expert witnesses in several hearings dealing with issues related to groundwater and land use. Earth sciences satellite data and models are helping to define the physical characteristics of drainage basins and in evaluating water resources. This data is also used to monitor and map floods, assess the damage they cause and add a predictive component.

Recognizing there is a knowledge gap related to the nation's main aquifers, NRCan organized a national workshop of experts in June 2000. Federal, provincial, territorial and municipal governments, academia and the private sector identified the key groundwater issues that Canada must address in the coming years to gain a better understanding of the knowledge gaps in Canada. The main objectives were to assess the current knowledge of the aquifers of the main regions of Canada, to evaluate the status of those aquifers by identifying issues and stresses to which they are exposed, to identify, on a broad perspective, problems common to different aquifers as well as specific regional problems, and to initiate a dialogue among provinces and federal agencies. The results of this meeting will be used to define orientations and identify priorities of groundwater research and form a basis to establishing a Canadian strategy and eventual partnerships to address knowledge gaps.

What's Next?

NRCan will continue to actively be involved in joint groundwater-related programs and in providing sound scientific advice on key water issues that will assist governments in making decisions on growing issues associated with groundwater, recurrence of floods and water management in general. It will continue to further its dialogue between federal and provincial officials on a broad set of priority water issues in Canada and demonstrate its role and contribution to the understanding of scientific techniques, processes and models pertaining to the sustainable development of groundwater resources. In addition, it will continue to report progress on water files to the Minister's National Advisory Board on Earth Sciences and respond to the Board's recommendations. NRCan welcomes the opportunity to provide Parliamentarians, and other decision-makers, presentations on this vital resource which is intimately linked to the health and safety of all Canadians, as well as Canada's economy and environment.

[2] A moraine is an area of debris carried down and deposited by glacier.

D. External Recognition

NRCan is pleased to report that the following NRCan employees, organizations and partners, have received special recognition awards for their achievements.

Dr. Aicha Achab received the J. Willis Ambrose Medal from the Geological Association of Canada for her contributions to the earth sciences.

Andy Beregszaszy of CANMET's Energy Technology Centre in Ottawa and **Craig Fairbridge** of the National Centre for Upgrading Technology in Devon, Alberta, along with private sector partners **Gary Webster** and **Luc Allard** of Advanced Engine Technology Ltd., received a 2000 Federal Partners in Technology Transfer Award. The research team, and the engineers from Advanced Engine Technology Ltd, received the award for developing their diesel Ignition Quality Tester.

Dr. Robert Boyle received the American Association of Exploration Geologists Gold Medal for his key role in developing science in Canada, advancing knowledge of precious metals, applying geochemistry to mineral exploration, and to environmental issues in Canada and around the globe.

Goodfellow Technologies, a division of Stantec Global Technologies Ltd., won Canada's National Energy Efficiency Award for the Industry Process Tier II category for its Expert Fume System Optimization Process. This process is a computer based system developed specifically for electric arc furnace steelmakers. This system will save energy and effect post-combustion control. CANMET Energy Technology Centre, through its Emerging Technology Program, is financially supporting Goodfellow Technologies in developing this technology.

The Canadian Hydrogen Association awarded **Dr. Martin Hammerli** of CANMET's Energy Technology Centre, the Medal of Recognition for "Outstanding Services for the Advancement of Hydrogen Energy and Hydrogen Economy in Canada". This event took place at its 10th Canadian Hydrogen Conference held in Quebec, May 28-31, 2000. Dr. Hammerli was one of the founding members of the Canadian Hydrogen Association in 1982 and organized its first "Canadian Hydrogen Workshop" in 1983, which was held in Vancouver.

During its 85th Annual Meeting, the Pulp and Paper Technical Association awarded **J.F. Houle**, École polytechnique de Montréal, **Yves Brousseau**, Donohue Forest Products Inc., **J.G. Dorica**, Paprican, and **Jean Paris**, CANMET's Energy Diversification Research Laboratory, the I.H. Weldon Award for their paper entitled *Reduction of Fresh Water Consumption for Process and Non-Process Uses in an Integrated Newsprint Mill*. This award is bestowed upon members who present the best paper from six months before to six months after the previous Annual Meeting.

Dr. Ted Irving received an honorary Doctor of Sciences from the University of Victoria for his contributions to the understanding of large-scale plate motions.

In 1999, **Dr. Krystyna Klimaszewska** received the Governor General's Meritorious Service Medal for research into somatic embryogenesis of pine trees. Dr. Klimaszewska achieved a breakthrough in somatic embryogenesis of pines, which provided Canada with the tools to be a front-runner in the development of a Canadian industry. Her creativity and innovation in the field of scientific research have also fostered major advancements in knowledge and expertise.

Dr. Tadeusz Kudra, senior research scientist at CANMET's Energy Diversification Research Laboratory, was honored by a Certificate of Recognition from McGill University for his services as Adjunct Professor of Chemical Engineering. The certificate recognizes his past and present teaching activity, and contribution to the success of the course "Project Laboratory". The course's objective is to teach students how to solve actual problems in industry, write progress reports, and give presentations.

Dr. Jason Lo presented the keynote lecture at the Sixth Annual International Conference on Composite Engineering in Orlando, Florida, USA. This world conference is one of the two largest in the field of composite materials with more than 600 papers presented.

Dr. V.M. Malhotra, Emeritus Scientist, gave the keynote presentation to more than 350 Indian engineers at the Conference on Sustainable Development and Concrete Technology in Hyderabad, India. A banquet was held one evening during the conference in honor of Dr. Malhotra's contributions to concrete technology worldwide. Dr. Malhotra also spent two weeks as Senior Visiting Fellow at the National University of Singapore, and he gave the keynote presentation to the attendees at the International Conference on Chemical Admixtures for Concrete in Mexico.

Dr. Larry Morley, the first Director General of the Canada Centre for Remote Sensing (CCRS), received "Officer" status of the Order of Canada. He was recognized for a number of achievements, especially founding the CCRS in the early 1970's.

Dr. David Piper received the Michael J. Keen Award from the Geological Association of Canada for his outstanding achievements in marine geoscience.

Dr. Winston Revie was elected a Fellow of the National Association of Corrosion Engineers and a Fellow of the Canadian Institute of Mining, Metallurgy and Petroleum.

The Korean Academy of Science and engineering and Dong-A University, Pusan, South Korea sponsored **Dr. Mahi Sahoo** to give two talks on casting technology. Their interest was in thin wall iron castings for automotive applications. The Academy also arranged for Dr. Sahoo to visit 11 Korean foundries and provide technical advice.

Dr. Denis St. Onge was featured in "Great Canadians: Scientists" for contributions to promoting earth sciences in Canada.

Dr. Thierry Toutin (Philip Cheng and David Stanley PCI Geomatics) received a Federal Partners in Technology Transfer Award for the development and transfer of algorithms and methods for the mapping applications of remote sensing and the commercialization of 3D rectification and visualization.

Dr. Bill Tyson became the 23rd recipient of the Canadian Metal Physics Medal for his contribution to the understanding of fracture mechanisms and to the application of fracture mechanics to engineering structures. He received the medal at the 11th Canadian Materials Science Conference held in June at the Royal Military College in Kingston, Ontario.

Dr. J.E. Udd, senior research scientist, was recognized by the Association of Professional Engineers of Ontario through their Peer Recognition Program for his technical achievements as well as his extensive volunteer services to the community.

Dr. Cees van Staal received the Geological Association of Canada's Past President's Medal in recognition of his achievement in the field of structural geology.

At the June 2000 conference of the Canadian Standards Association (CSA) International, **Valerie Whelan**, Equipment Standards Officer for the Energy Performance Regulations program, was honored with a CSA Award of Merit for her leadership in developing Canadian voluntary standards.

In 1999, **Dr. Eleanor White** received the Head of the Public Service Award of Excellence for the development of a unique DNA technology to identify illegally logged trees.

Lori Wilkinson, Jeff Harris, Cameron Bowie and Dr. Bruce Kjarsgaard received the Best Presentation Award at the International Conference on Geologic Remote Sensing.

The International Global Positioning System Service presented an “Outstanding Service” award to **NRCan for sponsoring Geodetic Surveys coordination of international Analysis Centres.**

Chapter technology awards were presented during a meeting of the American Society of Heating, Refrigeration and Air Conditioning Engineers Ottawa Valley. The First Prize award in the Existing Industrial Facility category was given to **NRCan for work done at CANMET Bells Corners**. This project was represented by Kevin Courneya of Rose Technology Group.

NRCan's Mapping Services Branch achieved official registration to the ISO 9001 international standard for quality management systems. The branch publishes Canada's topographic and related maps and data, provides mapping services including emergency mapping, and publishes Canada's aeronautical charts.

NRCan’s EnerGuide Labeling Program for major household appliances received an Award of Merit from the Toronto Chapter of the International Association of Business Communicators, for its package of information developed for the 1998 EnerGuide Month activities. The package included point of sale information, and pocket cards for appliance sales people.

NRCan's Fire Monitoring, Mapping and Modeling (FIRE/M3) project won the 1999 annual Agatha Bystram Award given by the Council of Federal Libraries. The award honors "excellence and innovation in the management of information resources and services within the Government of Canada". This project also won a Technology in Government Bronze Medal.

In 1999, 15 team members from **NRCan's Canadian Forest Service and Earth Sciences Sector** received the Bronze Award for Excellence in the Management of Information and Technology in the Public Sector for the Fire M3 Project (Fire Monitoring, Mapping and Modelling).

In 1999, 49 team members from **NRCan's Canadian Forest Service (CFS) and the Canadian Food Inspection Agency (CFIA)** received the Head of the Public Service Award – Excellence in Policy Category. This innovative partnership between the CFS and the CFIA has shown how science, policy and trade, when integrated together, can help develop programs that will aid in alien species inspection and enforcement to protect Canada's forests. This partnership contributed to the development of import regulations designed to keep the Asian long-horned beetle from entering Canada.

NRCan's map depicting Canadian land cover won two awards at the International Cartographic Association conference in Ottawa. The map was a collaborative effort between the Canada Centre for Remote Sensing and the Canadian Forest Service.

The Halton Catholic School Board of Southern Ontario presented to the **NRCan's Office of Energy Efficiency** (OEE) Energy Innovators Initiative a *Certificate of Distinction in recognition of Natural Resources Canada's financial contribution and ongoing support of their Environmental Awareness Initiative.* In the fall of 1998, the Board approved a $12 million Learning Environment Improvement Program aimed at slashing energy costs by 35 percent and improving the school's learning environment. These targets will be achieved through better lighting and air quality control, ultimately enhancing personal comfort levels. The OEE financed $350,000 of a pilot project of a $1.6 million investment in three schools. The incentive allowed the school board to implement a more comprehensive energy efficiency program.

As well, the first National Energy Efficiency Awards were presented to external organizations as part of the National Energy Efficiency Conference. The Minister presented fifteen awards in six categories. The awards recognize Canadian innovation and progress in making more efficient use of energy resources**.** The six categories were buildings (4 awards), industry (4), transportation (3), equipment (2), outreach (1) and a student competition (1).

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