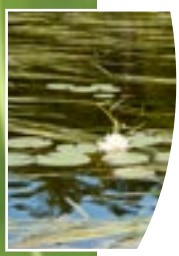
Environment Canada
Environnement Canada

The 2012 Progress Report of the Federal Sustainable Development Strategy



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Note the following corrections to Annex 1 of the 2010 FSDS. Please note:

- Implementation strategy 3.10.9 is not the responsibility of Environment Canada.
- Implementation strategy 4.1.6 is not the responsibility of Health Canada.
- Implementation strategy 4.1.9 is not the responsibility of Health Canada.
- Implementation strategy 5.2.2 is not the responsibility of Fisheries and Oceans Canada.

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Minister's Message

I am very pleased to table the 2012 Progress Report of the Federal Sustainable Development Strategy (FSDS). This report showcases the Government of Canada's innovative approach to strengthening sustainable development that was established through the *Federal Sustainable Development Act*.

Based on the first FSDS, tabled in October 2010, this report brings transparency to environmental decision-making by presenting a whole-of-government view of progress being made within four key areas:

- Addressing Climate Change and Air Quality;
- Maintaining Water Quality and Availability;
- Protecting Nature; and,
- Shrinking the Environmental Footprint – Beginning with Government.

The story that emerges from the most recent data available about the FSDS goals, targets and implementation strategies is both complex and encouraging. It is complex in that, clearly, the challenges are many and varied as we continue to learn more about ways to build a greener future while growing our economy and improving our quality of life. It is encouraging in that we also find progress being made in a number of key areas, as a result of efforts not only of the federal government, but also of provincial and municipal governments, as well as industry and individual Canadians. This progress includes:

- Canada has begun to decouple greenhouse gas emissions from economic growth;
- Canada is currently projecting to be about one half of the way towards meeting its 2020 greenhouse gas emissions reduction target under the Copenhagen Accord;
- Air quality in Canada is among the best in the world;
- The Great Lakes Areas of Concern are being restored;
- Since 1990, the protected area in Canada has nearly doubled; and,
- The federal government has made significant strides in greening its operations.

This whole-of-government view of results also represents progress in making federal environmental decision-making more transparent and accountable to Parliament as required by the *Federal Sustainable Development Act*.

While this report focuses on the work of the Government of Canada, Canada is fortunate that governments at all levels, as well as industry, non-governmental organizations and First Nations, are also contributing towards greater environmental sustainability. So in tabling this report, I want to thank my provincial and territorial colleagues, who have set their own ambitious programs and have partnered with many of our initiatives. Another thank-you must go to the private sector, non-governmental organizations and First Nations communities who have worked with us to create new and practical solutions towards environmental sustainability.

Finally, I wish to thank the thousands of Government of Canada employees, throughout the 27 federal departments and agencies, for the passion and commitment they have shown towards helping to build a greener Canada. Our work is only beginning. Through this report, we have a clearer view of the way forward.

The Honourable Peter Kent, P.C., M.P.
Minister of the Environment
Minister responsible for Parks Canada

Foreword

The starting point for this report is the requirement to provide a whole-of-government picture to parliamentarians and Canadians about how the federal government supports environmental sustainability and what progress the federal government has made. This report takes into account the work of 27 federal departments and agencies on some 400 implementation strategies that contribute to 38 targets, which in turn support the 8 goals of the 2010 Federal Sustainable Development Strategy (FSDS). This report shows how, as of 2012, the Government of Canada has contributed to the broad outcomes of the FSDS goals and targets. The reader is encouraged to explore online sources of information that are referenced throughout the report to obtain further details. These sources include the Departmental Sustainable Development Strategies of specific federal departments and agencies, where additional detail can be found on specific programs and activities, and the Canadian Environmental Sustainability Indicators program, which provides additional information about the indicators included in this report. Together, these sources provide a full picture of the federal government's sustainable development activities.

Executive Summary

This 2012 Progress Report of the Federal Sustainable Development Strategy (FSDS) highlights the progress of 27 federal departments and agencies towards achieving the goals and targets set out in the first cycle of the FSDS (2010–2013). For parliamentarians and Canadians, it provides a whole-of-government picture of the actions the federal government has taken to support environmental sustainability and highlights what has been accomplished thus far.

This report looks at sustainable development through the lens of the *Federal Sustainable Development Act* (FSDA), which requires that an FSDS be developed and implemented to make environmental decision-making more transparent and accountable to Parliament.

The 2010 FSDS has improved transparency through stronger planning and reporting that provides:

- An integrated, whole-of-government picture of actions and results to achieve environmental sustainability;
- A link between sustainable development planning and reporting and the government's core expenditure planning and reporting system; and,
- Effective measurement, monitoring and reporting to track and report to Canadians on progress made.

This report provides information on FSDS goals, targets and selected implementation strategies organized by four themes that represent key environmental priorities for Canadians:

- Addressing Climate Change and Air Quality;
- Maintaining Water Quality and Availability;
- Protecting Nature; and,
- Shrinking the Environmental Footprint – Beginning with Government.

As the first progress report of its kind under the FSDA, this report is a key milestone showing, at a broad level, that the Government of Canada is making progress both towards greater transparency and towards the FSDS goals and targets.

This report also presents the most up-to-date information available using indicators from the Canadian Environmental Sustainability Indicators (CESI) program. The information presented includes:

- Trends over time, such as emission levels of greenhouse gases and air pollutants, the release of pollutants into water, and the sustainability of biological resources, such as wood supply;

- Current measures of status, such as of major fish stocks, species at risk and availability of water; and,
- Baselines that have recently been established to track progress in key areas, such as exposures to chemicals.

This report is part of a whole reporting system that provides a comprehensive picture of progress against the FSDS goals and targets. It highlights key actions from selected implementation strategies of FSDS departments and agencies, and directs readers to more detailed information available on departmental websites. Additional links direct the reader to indicator information from the CESI website. Together these provide the reader with the means to review how the federal government works towards environmental sustainability and where more information can be found in specific areas. Through this report and these linkages, the FSDS makes environmental decision-making more transparent and accountable to Parliament.

In keeping with the approach of "plan-do-check-improve," this report also points to challenges and underscores the opportunities to further improve environmental sustainability. This is an important step as the Government of Canada develops the next cycle of the 2013–2016 FSDS and future progress reports.

SECTION 1

CONTEXT

This Report

This 2012 Progress Report highlights the progress of 27 federal departments and agencies towards the goals and targets set out in the 2010 Federal Sustainable Development Strategy (FSDS). It provides parliamentarians and Canadians with a whole-of-government picture of the contributions of the federal government to achieve environmental sustainability, with a focus on what has been accomplished thus far. This report is submitted by the Sustainable Development Office of Environment Canada to the Minister of the Environment and tabled in each House of Parliament, as required by the *Federal Sustainable Development Act*. As the first substantive report on the first cycle of the FSDS (2010–2013), it establishes the starting point and a baseline for future cycles of the FSDS and reports on progress.

The Federal Framework for Sustainable Development

This report looks at sustainable development through the lens of the *Federal Sustainable Development Act,* which requires that an FSDS be developed and implemented to make environmental decision-making more transparent and accountable to Parliament. For the first time, Canadians have, in one place, comprehensive information on activities across the federal government that contribute to environmental sustainability. The FSDS renders environmental decision-making more transparent and accountable using an improved framework for planning and reporting by providing:

- An integrated, whole-of-government picture of actions and results to achieve environmental sustainability;
- A link between sustainable development planning and reporting and the government's core expenditure planning and reporting system; and,
- Effective measurement, monitoring and reporting in order to track and report on progress to Canadians.

Federal commitments towards sustainable development were set out in the 2010 FSDS, organized under four themes that represent key environmental priorities for Canadians. These are:

- **Addressing Climate Change and Air Quality**
- **Maintaining Water Quality and Availability**
- **Protecting Nature**
- **Shrinking the Environmental Footprint – Beginning with Government**

Within the themes, there are a series of goals that are aspirational, take a long-term view, address important challenges, and reflect domestic and international priorities and commitments. Each goal has targets that are more specific in nature and strive to meet the SMART criteria (i.e., Specific, Measurable, Achievable, Relevant and Time-bound). These goals and targets are supported by implementation strategies that are specific activities aimed at supporting the targets set out in the FSDS. To achieve these goals and targets, the federal government frequently works in collaboration with various jurisdictions. While activities of other governments, industry and individuals all contribute to results, the 2010 FSDS reflects the federal contributions towards these targets. In some cases, the role is direct (e.g., regulations), while in others, the federal government plays a supporting part (e.g., providing science). As a result, some of the FSDS targets aim to achieve environmental outcomes, while others focus on completing actions in support of an overall objective.

What You Will Find

A key step in making environmental decision-making more transparent is to report on progress. There are three key vehicles that support this objective.

1. This 2012 Progress Report;
2. Departmental Sustainable Development Strategies (DSDSs); and,
3. Canadian Environmental Sustainability Indicators (CESI).

Each of these plays a key role in providing information on the progress of the 2010 FSDS.

This report presents the progress on the FSDS goals and targets, supported by 34 CESI indicators and highlights of key actions from selected implementation strategies of the FSDS departments and agencies. Links are provided to the CESI website and to detailed information on the departmental websites that house departmental planning and performance reports and the DSDSs. These links provide the reader with the means to review how the federal government is working towards environmental sustainability.

A chapter on each FSDS theme opens with an "At a Glance" view of the progress to date towards each goal, then highlights significant achievements from the FSDS departments and agencies, and, finally, identifies some of the challenges that remain. This opening snapshot is supported by a review of "Why It Matters" to Canadians, emphasizing the social and economic significance of environmental sustainability.

The rest of the chapter provides the most up-to-date environmental scientific and performance information that was available in 2012 on the FSDS goals and targets. The chapters provide additional context about some targets, as well as information on key implementation strategies and indicator results.

There are, however, limits on the extent to which this report can link progress on results directly to specific initiatives. The objective, rather, is to identify the contributions of departments and agencies towards the FSDS goals and targets. In some cases, the data in this report establishes a baseline against which future reports can be measured. The linkages between the broad outcomes and federal government actions — environmental indicators and the performance measures of various implementation strategies — provide greater transparency about what federal government programs and policies are trying to achieve. Over time, these linkages will evolve and become more direct.

This report is an important step as the Government of Canada develops the second cycle of the FSDS (2013–2016). As such, this report and those that follow will reflect the changing policy landscape, making adjustments to respond to new evidence, and improvements to better track results of federal government efforts that contribute to achieving sustainable development.

SECTION 2

ADDRESSING CLIMATE CHANGE AND AIR QUALITY

Canada has begun to decouple greenhouse gas emissions from economic growth.

Even though the economy grew by 6.3% between 2005 and 2010, greenhouse gas emissions decreased by 48 megatonnes or 6.5% in that same period.

Current trends indicate that Canada is on track to achieve half of the reductions as required under Copenhagen.

Current projections show that Canada is about one half of the way towards meeting its national greenhouse gas reduction target.

Performance to Date

- The Government of Canada has begun to regulate two of Canada's largest sources of greenhouse gas emissions — transportation and electricity.
- Greenhouse gas emissions standards, harmonized with national standards in the United States, are in place for new cars and light trucks (2011–2016 model years). In 2012, proposed regulations were announced to establish more stringent standards for model years 2017 and beyond.
- Federal regulations now require an average of 5% renewable content in gasoline and, as of July 2011, 2% renewable content for diesel and heating oil.
- In 2012, the Government of Canada published regulations to reduce carbon dioxide emissions from coal-fired electricity generation. Starting July 1, 2015, the regulations apply a stringent performance standard to new coal-fired electricity generating units and old units that have reached the end of their useful life.
- Canada endorsed the Durban Platform, a negotiation framework for a new international climate change agreement to include all emitters, for completion by 2015 and implementation by 2020.
- Canada's energy sector was improved through advancements in clean electricity and cleaner energy production, increased use of alternative fuels, and improvements in end-use energy efficiencies.
- Canada is contributing $1.2 billion in fast-start financing between 2010 and 2013 to support developing countries' efforts to address climate change.

Remaining Challenges

- In 2009, the Government of Canada committed under the Copenhagen Accord to reduce Canada's greenhouse gas emissions by 17% below 2005 levels by 2020, establishing a 2020 target of 607 megatonnes.
- Canada's total greenhouse gas emissions in 2010 were 692 megatonnes.
- Current projections show that, based on existing and announced actions by the federal and provincial governments, businesses and consumers, Canada is about one half of the way towards meeting its target. Additional measures will be required to close the remaining gap.

Air quality in Canada is among the best in the world.

Concentrations of fine particulate matter — a pollutant that is harmful to human health — had no overall increase or decrease over the 10 years up to 2010.

Between 1990 and 2010, emissions of most key smog-forming air pollutants decreased by 18% to 57%; only ammonia was higher than 1990 levels.

Performance to Date

- The Government of Canada is working to improve air quality and the health of Canadians in collaboration with provinces, territories and stakeholders through the development of an Air Quality Management System. This system will introduce new ambient air quality standards, provide a framework for managing air quality and the transboundary flow of air pollutants through local air zones and regional airsheds, and will establish emissions requirements for major industrial sectors.
- Canada has made strategic investments in the commercialization and adoption of clean energy technologies to help the energy sector improve its air pollution emission performance.
- In 2011, Canada introduced regulations to reduce air pollutant emissions from snowmobiles, personal watercraft, outboard motors and off-road motorcycles, in alignment with U.S. Environmental Protection Agency (EPA) standards. Also in 2011, more stringent air pollutant emission standards were introduced for off-road diesel engines, such as those found in tractors and forklifts, to align with current U.S. EPA standards.
- After more than 20 years of Canada-U.S. cooperation under the Air Quality Agreement, emissions that cause acid rain have been reduced by more than 50% and emissions causing smog by 40% in the geographic area covered under this agreement.
- Since the launch of the Chemicals Management Plan in 2006, the Government of Canada has worked closely with health and environment groups, consumer groups and industry to reduce risks to Canadians and the environment by setting clear priorities for the assessment and management of hundreds of chemicals.
- In August 2010, Government of Canada published the *Report on Human Biomonitoring of Environmental Chemicals in Canada*, which presents the first-ever comprehensive set of biomonitoring data for the Canadian population. This baseline information about the levels of chemicals in the Canadian population is critical to advancing health surveillance and research and assessing the effectiveness of actions by governments and others in Canada.

Remaining Challenges

- Ammonia emissions increased by 10% between 1990 and 2010, as did the national average ambient concentrations of ground-level ozone.
- Between 1990 and 2010, ground-level ozone concentrations have been rising. Fine particulate matter concentrations remained unchanged during the same period.
- Approximately 7% of Canadian homes have radon concentrations above 200 becquerels per cubic metre, the level at which remedial measures should be undertaken.

Why It Matters

Climate change is a global challenge that requires a global solution. At increasing rates over the last 200 years, humans have released greenhouse gases (GHGs) into the atmosphere by burning fossil fuels. These gases prevent heat from escaping, which in turn creates a greenhouse effect and contributes to the warming of the Earth's surface.

There is a general scientific agreement that accumulated GHGs in the atmosphere cause climate change. Scientists strongly agree that the potential environmental impacts of climate change are very significant. Canada is a vast country with a diverse climate, where the impacts of climate change are all the more important and are becoming evident. In the North, for example, the impacts range from reduced Arctic ice cover and increased degradation of permafrost, to a shorter ice road season. In other regions of Canada, impacts include accelerated erosion and more extensive flooding due to sea level rise and more frequent storms in the Atlantic region, stress on fisheries due to rising water temperatures and more severe forest pest infestations in British Columbia, and more frequent droughts, wildfires and severe floods in the Prairies.

Canada is a vast country with a diverse climate, where the impacts of climate change are all the more important and are becoming evident.

As illustrated in Table 2.1, a number of key economic sectors such as transportation, oil and gas, and electricity contribute to Canada's GHG emissions. The future trend, however, for GHG emissions in Canada depends on a number of factors including economic activity, population, development of energy markets and their influence on prices, technological change, consumer behaviour, and government actions.

Table 2.1: Greenhouse gas emissions, by economic sector, Canada, 1990 to 2010

	Greenhouse gas emissions (Mt CO_2 equivalent)							
Economic Sectors	**1990**	**2000**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
NATIONAL GHG TOTAL	589	718	740	726	751	731	690	692
Oil and Gas	100	150	160	161	165	160	161	154
Electricity	92	128	122*	115	124	112	96	99
Transportation	128	155	170	169	172	172	162	166
Emissions-intensive & Trade-exposed Industries	96	88	90	89	90	87	74	75
Buildings	70	81	85	80	85	85	82	79
Agriculture	54	65	67	66	68	68	67	69
Waste & Others	49	50	48	46	48	47	47	50

Source: *Canada's Emissions Trends 2012*. *Updated to reflect analysis for the *Reduction of Carbon Dioxide Emissions from Coal-fired Generation of Electricity Regulations*.

In addition to GHG emissions, the quality of air Canadians breathe is important. Air pollution from sources such as transportation and industrial activities can affect health, the natural environment and the economy.

Even modest increases in air pollution, often seen as smog, can cause small but measurable increases in emergency room visits, hospital admissions and premature deaths. The health effects can have an impact on the economy through reduced work attendance and overall participation in the labour force. According to the Canadian Medical Association, as a result of increased health care costs, reduced worker productivity, reduced quality of life due to illness and loss of life, air pollution costs Canadians and the Canadian economy more than $8 billion per year.

Industrial activity, transportation, electricity and heat production, and the use of products such as paints and solvents are major sources of air pollution, as outlined in Table 2.2.

Table 2.2: Distribution of air pollutant emissions by source, Canada, 2010

Source	Percent of National Emissions					
	Sulphur oxides	Nitrogen oxides	Volatile organic compounds	Ammonia	Carbon monoxide	Fine particulate matter
Oil and Gas Industry	24.3	22.2	33.9	0.3	5.1	4.3
Other Industries	40.8	8.5	9.2	3.1	11.2	23.1
Transportation (Road, Rail, Air, Marine)	6.9	33.1	13.1	4.9	42.8	9.0
Off-road Vehicles	< 0.1	22.3	15.4	0.2	32.0	16.0
Fuel for Electricity and Heating	27.9	13.5	0.3	0.2	1.0	5.2
Home Firewood Burning	0.1	0.5	8.7	0.2	7.8	42.5
Paints and Solvents	–	–	19.2	–	–	–
Agriculture (Livestock and Fertilizer)	–	–	–	91.2	–	–

Note: Emissions from natural sources (e.g., forest fires), open sources (e.g., road dust), incineration and miscellaneous are not included, except for ammonia (NH_3), where agricultural sources have been included in the indicator.

For more information, please visit CESI.

Canadians are also exposed to other toxic air pollutants, including mercury and hexavalent chromium. Mercury is a naturally occurring metal that can be released to the air by human activities, including base metal smelting, waste incineration, and the use of products such as electrical switches and fluorescent lights. Hexavalent chromium is a known carcinogen and can be released to the air as a by-product of fossil fuel combustion or from various industrial processes, including those associated with aerospace, and pulp and paper. These pollutants were declared toxic substances under the *Canadian Environmental Protection Act, 1999*.

In addition to outdoor air quality, indoor air quality is also important, as a large number of air pollutants are found in Canadian homes, often at much higher levels than are found outdoors, increasing the risk of lung cancer (radon), breathing difficulties, asthma and allergy symptoms, and heart problems.

Reducing Greenhouse Gas Emissions

Goal 1: Climate Change – *Reduce greenhouse gas emission levels to mitigate the severity and unavoidable impacts of climate change.*

Progress Towards Goal 1: *National greenhouse gas emissions indicator*

According to the International Energy Agency, Canada's carbon dioxide (CO_2) emissions from fuel combustion in 2009 accounted for approximately 2% of global emissions.

Canada's GHG emissions are increasingly becoming decoupled from economic growth. Even though the economy grew by 6.3% between 2005 and 2010, GHG emissions decreased by 48 megatonnes (Mt) or 6.5%. Between 2005 and 2010, Canada's GHG emissions for each billion dollars of gross domestic product (GDP) that Canada produced declined by about 12%, and GHG emissions per person have declined by about 11%. These per capita emissions are at a historic low of 20.3 tonnes (t) of carbon dioxide equivalent per person. This is the lowest level recorded since tracking began in 1990. In 2010, per capita emissions of CO_2 were 2.6 t lower than in 2005.

The 2010 GHG emissions were lower in almost every sector of the Canadian economy than 2005 levels. This is a result of factors such as the global economic downturn, changes to energy efficiency technology, changes in energy prices, and a decrease in the energy intensity of the economy. Moreover, federal and provincial government actions to reduce emissions had a significant impact on emissions over this time period.

Relative to 2005, GHG emissions in the public electricity and heat generation sector have decreased by 23 Mt (about 19%); emissions in emissions-intensive and trade-exposed industries (e.g., mining, pulp and paper, cement, iron and steel) have decreased by 15 Mt (about 17%); and emissions from the oil and gas sectors (including the oil sands industry) have decreased by 6 Mt (about 4%).

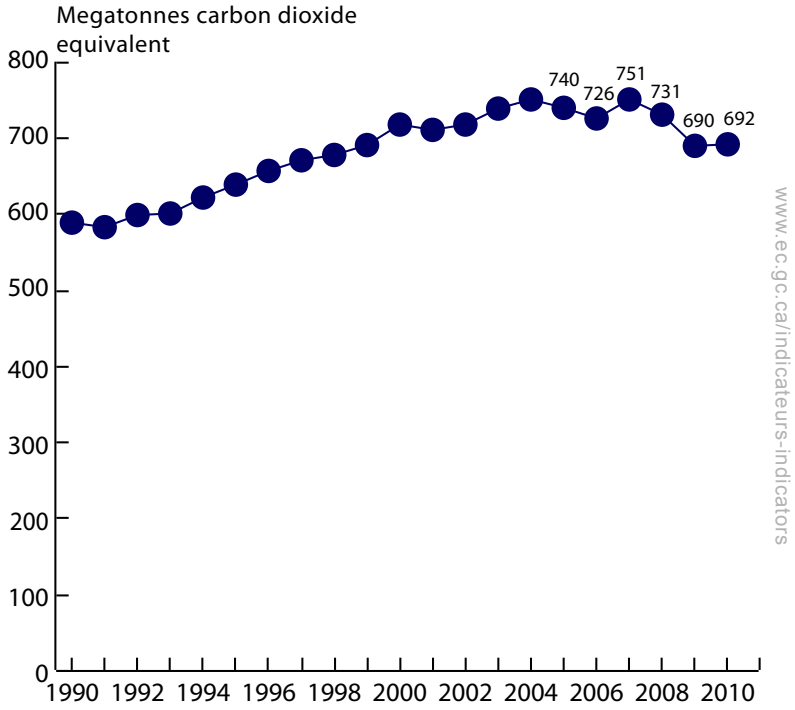
Canada's total greenhouse gas emissions in 2010 were 692 megatonnes (Mt) of carbon dioxide equivalent, or 17% (102 Mt) above the 1990 emissions of 589 Mt. Steady increases in annual emissions characterized the first 15 years of this period, followed by an overall decline in the period for 2005–2010.

Canada's total GHG emissions in 2010 were 692 Mt of carbon dioxide equivalent, or 17% (102 Mt) above the 1990 emissions of 589 Mt as shown in Figure 2.1. Steady increases in annual emissions characterized the first 15 years of this period, followed by an overall decline in the period for 2005–2010.

Changes in behaviour by consumers and businesses, in part due to federal, provincial and territorial actions, are leading to a decline in emissions intensity. Sectoral shifts in the economy, with higher growth in less emissions-intensive sectors outpacing growth in emissions-intensive ones, are also contributing to further decoupling of emissions from Canada's gross domestic product.

For the most up-to-date information on this indicator, please visit CESI.

Figure 2.1: National greenhouse gas emissions, Canada, 1990 to 2010



Source: Adapted from the *National Inventory Report 1990–2010: Greenhouse Gas Sources and Sinks in Canada – Executive Summary*.

Reducing Canada's greenhouse gas emissions

Target 1.1: Climate Change Mitigation – *Relative to 2005 emission levels, reduce Canada's total greenhouse gas emissions 17% by 2020.*

The Government of Canada is taking action on climate change domestically and internationally. Under the Copenhagen Accord, Canada inscribed a GHG emission reduction target that is aligned with the U.S. target, this being 17% below 2005 levels by 2020 — equivalent to 607 Mt based on Canada's original 2005 baseline.

The Government of Canada is continuing to implement its plan to regulate GHG emissions on a sector-by-sector basis, aligning with the U.S. where appropriate. The Government of Canada has already put regulations in place to address emissions from the electricity and transportation sectors — two of the largest sources of Canadian emissions — and is moving forward to develop regulations for other major emitting sectors including oil and gas. This is complemented by clean energy initiatives, adaptation efforts and international engagement.

As a result of the combined efforts to date of federal and provincial governments, consumers and businesses, Canada is projected to reduce its emissions by 130 megatonnes in 2020 when compared to projected business-as-usual greenhouse gas emissions in 2020. This is about half the emissions reductions needed to meet Canada's 2020 emissions target.

Domestic agenda

Sector-by-Sector Regulatory Approach: Industrial Sources

Canada is implementing a sector-by-sector approach to reducing GHG emissions in major-emitting sectors. Given the highly integrated North American economy, the Government of Canada is aligning its climate change approach with that of the U.S., as appropriate for Canadian circumstances. The sector-by-sector approach makes it possible to tailor regulations to sector circumstances, integrating environmental and economic considerations. Regulations are being designed to provide regulatory certainty for industry, drive investments in clean energy technologies, and leverage capital stock turnover to minimize costs and consumer impacts. The Government of Canada's efforts to reduce GHGs and air pollutant emissions are supported by funding allocated through the Clean Air Regulatory Agenda.

In 2012, the Government of Canada published regulations to address GHG emissions from coal-fired electricity generation. These set stringent performance standards for new facilities and old ones that have reached the end of their useful lives. Starting in July 2015, these regulations will encourage companies to phase out traditional coal-fired units and invest in low- and non-emitting technologies. The regulations, in combination with the commitments made by the provinces and industry and other measures, are projected to reduce GHG emissions from the electricity sector by 41 Mt between 2005 and 2020, from 122 Mt to 81 Mt.

The Government of Canada is also developing sector-specific regulatory approaches to address GHG emissions from oil and gas as well as other major emitting industrial sectors.

Sector-by-Sector Regulatory Approach: Clean Transportation

Regulations are a key component of the government's efforts to promote clean transportation. The Government of Canada has put in place GHG emissions standards for new cars and light trucks for the 2011–2016 model years. These are harmonized with U.S. standards and are expected to result in annual reductions of 9 to 10 Mt in Canada by 2020. In 2012, the government announced proposed regulations for more stringent GHG emission standards, in alignment with the U.S., for cars and light-trucks of model years 2017 and beyond.

In 2012, the government proposed regulations to reduce GHG emissions for new on-road heavy-duty vehicles, such as buses and tractor-trailers, for model years 2014 to 2018. The proposed standards are expected to reduce GHG emissions from 2018 heavy-duty vehicles by up to 23% from those sold in 2010.

As of December 2010, the *Renewable Fuels Regulations* require an average of 5% renewable content in gasoline and, as of July 2011, 2% renewable content for diesel and heating oil. The GHG reductions from the regulation of renewable content in fuels are equivalent to removing one million vehicles from the road.

To help inform the regulatory process, Canada worked with vehicle manufacturers, industry associations, governments and other stakeholders to test and evaluate emerging vehicle technologies.

Finally, the government continued to advance efforts in the aviation, rail and marine transportation sectors, both domestically and internationally. For example, the government is developing new marine emission regulations under the *Canada Shipping Act, 2001* and air pollutant emission regulations for locomotives. Together the government and the Canadian aviation industry have developed Canada's Action Plan to Reduce Greenhouse Gas Emissions from Aviation. The government also addresses GHG and air pollution emissions through a series of complementary measures.

Clean Air Agenda

Since 2007, Canada has addressed climate change and air pollution through the Clean Air Agenda (CAA). The CAA was renewed in 2011 to support: initiatives to reduce GHGs and improve air quality; advances in innovation for clean energy and transportation, and for improved indoor air quality; helping Canadians adapt to climate change; and, engagement with international partners. This chapter includes both 2010 FSDS Implementation Strategies and CAA programs, highlighting CAA contributions of 2011–2012. Information on the financial performance of CAA programs is set out in Annex A. Additional details about CAA programming may be found in Departmental Sustainable Development Strategies of CAA departments and agencies.

Clean Energy

Canada promotes clean energy by improving environmental performance, advancing clean electricity and cleaner energy production, increasing the production capacity and use of alternative fuels, and improving end-use energy efficiencies.

The ecoENERGY suite of programs encourages production of low-impact renewable energy, helps Canadians improve their energy use, and accelerates the development and market readiness of technology solutions. The ecoENERGY Efficiency program delivered initiatives that improved energy efficiency in Canada and achieved energy savings of more than 5 petajoules in 2011–2012. In particular, the National Energy Code for Buildings was published in November 2011, and the new code is now ready for adoption or adaptation by provinces and territories. As part of the ecoENERGY for Aboriginal and Northern Communities program, 36 Aboriginal and northern communities received funding in 2011–2012 to support clean energy projects that are expected to reduce GHG emissions by 0.9 Mt over the course of their 20-year project life cycles.

Canada has also furthered research and regional cooperation towards the development of Atlantic Canada's clean energy resources under the Atlantic Energy Gateway. Research found significant potential benefits from regional collaboration in this sector.

Adaptation

Building on prior work, the government renewed domestic climate change adaptation funding in 2011 with a $148.8 million investment over five years (2011–2016). Some programs build the scientific foundation for understanding and predicting climate and assessing climate change impacts; some enhance public health and safety; others foster the competitiveness of climate-sensitive economic sectors and systems across Canada; while others build resilience in the North and climate-sensitive Aboriginal communities.

Canada is collaborating with the provinces and territories, industries, and stakeholders to help decision-makers understand the relevance of climate change to their operations and manage the risks by equipping them with appropriate tools and information.

Forestry and Agriculture

The government is taking additional action in forestry and agriculture sectors to complement its regulatory agenda.

The forestry sector makes important contributions to GHG emissions, both because forests store carbon and from the emissions of the industry itself. The National Forest Carbon Monitoring, Reporting and Accounting System has provided the foundation for a Carbon Budget Model of the Canadian Forest Sector. It enables annual estimates of forest-related carbon stock changes and GHG emissions for the annual GHG National Inventory Report required under the United Nations Framework Convention on Climate Change (UNFCCC). As well, a model for estimating emissions associated with carbon in harvested wood products has been developed and will be used to meet international commitments.

The Investments in Forest Industry Transformation Program supports projects that produce new bioproducts, including advanced bio-composites and bioenergy, while maximizing the value of wood fibre harvested.

Since 2009, the Pulp and Paper Green Transformation Program has invested $950 million in energy efficiency and renewable energy production for Canada's pulp and paper sector. This has helped reduce GHG emissions in pulp and paper mills in Canada by more than 10% from 2009 levels — some 543 000 t per year — while positioning the sector as a leader in forest biomass-based renewable energy. Across Canada, 98 projects in 38 communities are expected to increase the generation capacity of renewable electricity by 200 megawatts per year, and the production of renewable thermal energy by 4.4 million gigajoules (GJ) per year, and to save 8.5 million GJ of energy annually. The program's environmental achievements significantly exceed initial expectations, and have supported approximately 14 000 direct jobs in the forest sector.

The government's Sustainable Agriculture Environmental Systems initiative has improved scientific understanding of agriculture's interaction with the environment. It has also funded scientific research to improve understanding of the impacts of agricultural activities on GHG emissions, particulate matter and other pollutants, as well as the development of tools, practices and technologies to reduce and mitigate emissions. In addition, the National Carbon and GHG Accounting and Verification System has improved the ability to measure and monitor GHG emissions associated with agriculture, leading to targeted and efficient reduction measures.

The government has also launched the Agricultural Greenhouse Gases Program as part of the Greenhouse Research Alliance, aimed at increasing international cooperation, collaboration and investment in public and private research activities to help the sector reduce GHG emissions while enhancing productivity and resilience to climate change.

International agenda

Canada committed to reducing its GHG emissions 17% by 2020 from 2005 levels and has endorsed the Durban Platform, a negotiation framework for a new international climate change agreement to include all major emitters, for completion by 2015 and implementation by 2020.

In response to international commitments under the Copenhagen Accord, Canada is contributing $1.2 billion in fast-start financing between fiscal year 2010–2011 and 2012–2013 to support developing countries' efforts to address climate change.

Canada engaged in international partnerships that leverage private sector investment in clean energy projects in developing countries. In addition, Canada works with international partners, such as the Arctic Council, to address short-lived climate pollutants (e.g., black carbon, methane and some hydrofluorocarbons).

Canada engaged in international partnerships that leverage private sector investment in clean energy projects in developing countries.

Canada is also a founding partner of a new international Climate and Clean Air Coalition to Reduce Short Lived Climate Pollutants (SLCPs), launched in 2012, which will further advance efforts to reduce these pollutants and address near-term climate change. Activities to support the mitigation of SLCPs in developing countries include: helping to reduce fugitive methane emissions in the oil and gas sector; addressing methane from landfills; and, supporting clean cookstove initiatives.

Canada also provided leadership in key bilateral mechanisms such as the U.S.-Canada Clean Energy Dialogue. This is one of the ways that Canada is working with key countries to find practical solutions to address climate change and support Canada's transition to a low carbon economy.

For additional information on the implementation strategies that support this target, please consult the following websites: Aboriginal Affairs and Northern Development Canada, Agriculture and Agri-Food Canada, Atlantic Canada Opportunities Agency, Canada Economic Development for Quebec Regions, Environment Canada, Finance Canada, Fisheries and Oceans Canada, Foreign Affairs and International Trade Canada, Health Canada, Human Resources and Skills Development Canada, Industry Canada, National Research Council Canada, Natural Resources Canada, Parks Canada, Public Health Agency of Canada, Standards Council of Canada, Transport Canada and Western Economic Diversification Canada.

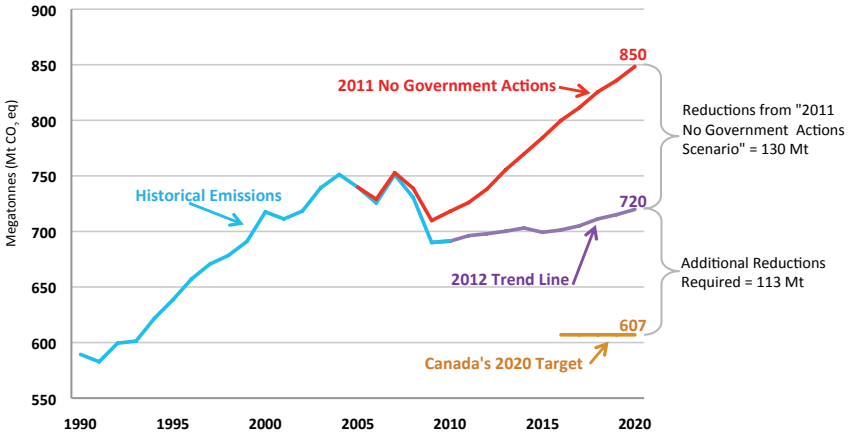
Progress Towards Target 1.1: *Government of Canada actions to meet greenhouse gas emission reduction target*

As a result of the combined efforts to date of federal and provincial governments, consumers and businesses, Canada is projected to reduce its emissions by 130 Mt in 2020 when compared to projected business-as-usual GHG emissions for 2020. This is about half the emissions reductions needed by 2020 to meet Canada's emissions target.

In August 2012, *Canada's Emissions Trends 2012* report projected that Canada's GHG emissions will be 720 Mt in 2020. This is 65 Mt less than the levels projected initially by Canada's Emissions Trends 2011 report. The reduction is due to several factors: using more up-to-date historical data that shows greater progress in decoupling gross domestic product and emissions, the inclusion of additional federal and provincial GHG reduction measures, and taking into account the effect of Land Use, Land Use Change and Forestry (LULUCF) land management activities that act as a carbon dioxide sink (i.e., remove CO_2 from the atmosphere) or a GHG source (emit CO_2 and other GHGs to the atmosphere). This is consistent with the UNFCCC's recognition of the important role of the LULUCF sector in addressing climate change.

In the year 2020, the gap between Canada's GHG emissions target of 607 Mt is now projected to be 113 Mt. This means that Canada's 2020 emissions are projected to be about one half of the way to the target. Figure 2.2 displays Canada's historical GHG emissions and projections to 2020.

Figure 2.2: Canada's historical greenhouse gas emissions and projections to 2020



Source: Adapted from *Canada's Emission Trends 2012*.

Minimizing Threats to Air Quality

Goal 2: Air Pollution – *Minimize the threats to air quality so that the air Canadians breathe is clean and supports healthy ecosystems.*

The national average ambient level of fine particulate matter has been steady since 2000. In 2010, the value was 8.7 micrograms per cubic metre.

The national average ambient ground-level ozone trend has been rising from 1990 to 2010. In 2010, the national average ambient concentration of ground-level ozone was 38.2 parts per billion.

Progress Towards Goal 2: *Ambient air quality (ground-level ozone and fine particulate matter)*

air quality is important to human health, the natural environment and the economy, and so the government has been taking action on key sources and major emitting sectors, while recognizing that many sources lie beyond Canada's border.

To provide a basis for measuring the ambient air quality, air pollutants are tracked, such as the concentration of fine particulate matter in the air. The national average level of fine particulate matter has not changed significantly over the period between 2000 to 2010. In 2010, the average concentration in Canada of fine particulate matter ($PM_{2.5}$) in the air was 8.7 micrograms per cubic metre, 24% higher than in 2009. The likely factors contributing to this increase include forest fires in Saskatchewan, British Columbia and Quebec, and a warm and dry year in many parts of Canada compared to 2009. Figure 2.3 reveals no statistically significant increasing or decreasing trend in Canada's average concentrations of $PM_{2.5}$ since 2000.

The national average ground-level ozone trend has been rising from 1990 to 2010, increasing 10% over the period. In 2010, the average concentration of ground-level ozone (O_3) in outdoor ambient air was 38.2 parts per billion (ppb) in Canada. The increase is mainly due to 2010 being a warmer and dryer year than 2009. Figure 2.4 illustrates the rising trend in ground-level ozone concentration between 1990 and 2010.

For the most up-to-date information on these indicators, please visit CESI ($PM_{2.5}$, O_3).

Figure 2.3: Fine particulate matter concentrations, Canada, 2000 to 2010

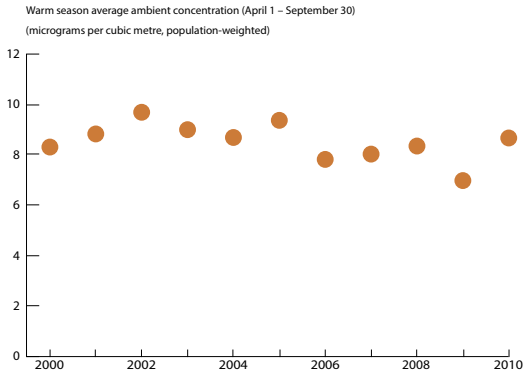
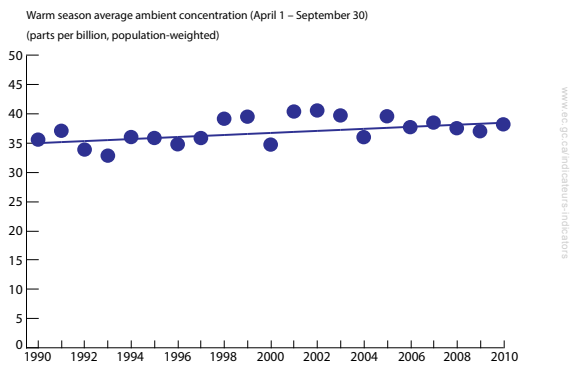


Figure 2.4: Ground-level ozone concentrations, Canada, 1990 to 2010



Progress Towards Goal 2: *Ambient air concentration of sulphur dioxide, nitrogen dioxide and volatile organic compounds*

Overall, the national average ambient air concentrations of sulphur dioxide, nitrogen dioxide and volatile organic compounds are on a downward trend from 1996 to 2010.

Overall, the national average ambient air concentrations of sulphur dioxide, nitrogen dioxide and volatile organic compounds are on a downward trend from 1996 to 2010.

In 2010, the national average concentration of sulphur dioxide (SO_2) in the air was 1.8 ppb in Canada, 17% lower than in 2009. From 1996 to 2010 the trend declined, with concentration decreasing by 62%, due mainly to efforts to curb acid rain and ambient particulate matter, and federal regulations on sulphur content in fuels. Figure 2.5 illustrates the decline in SO_2 concentration since 1996.

The national average concentration of nitrogen dioxide (NO_2) in the air for 2010 was 10.8 ppb, 6% lower than in 2009. The trend declined from 1996 to 2010, showing a decrease of 38% over that period. The decrease in NO_2 concentration is consistent with the reduction in nitrogen oxides (NO_x) emissions from cars and trucks as a result of the introduction of more stringent emissions standards from the government over the past years. Figure 2.6 shows this declining trend from 1996 to 2010.

The national average concentration of the measured volatile organic compounds (VOCs) in the air for 2010 was 57.5 parts per billion carbon, or 7% lower than in 2009. The trend declined from 1996 to 2010, representing a concentration decrease of 57% over that period. The decrease in VOC concentration is also consistent with the reduction in VOC emissions from cars and trucks resulting from the introduction of more stringent emissions standards. The decline in VOC emissions from 1996 to 2010 is illustrated in Figure 2.7. For the most up-to-date information on these indicators, please visit CESI (SO_2, NO_2, VOCs).

Figure 2.5: Sulphur dioxide concentrations, Canada, 1996 to 2010

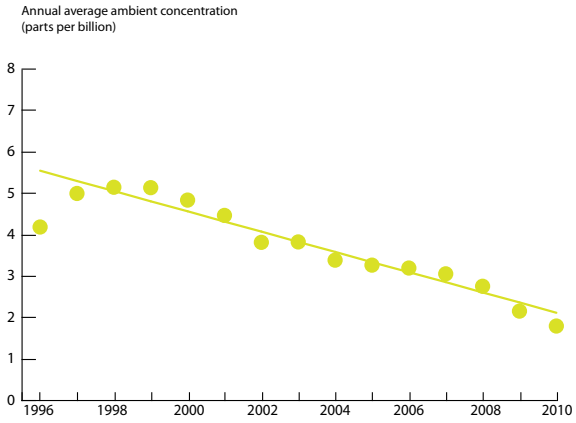


Figure 2.6: Nitrogen dioxide concentrations, Canada, 1996 to 2010

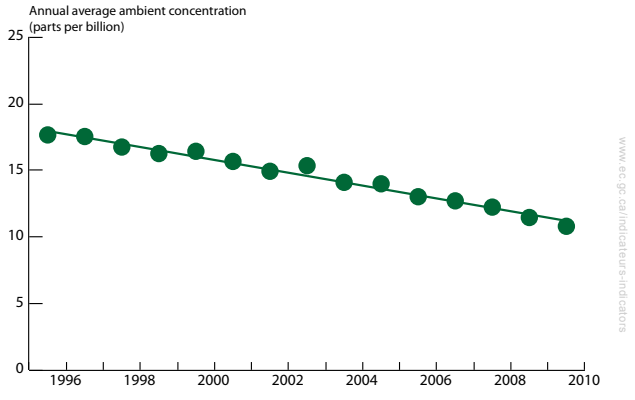
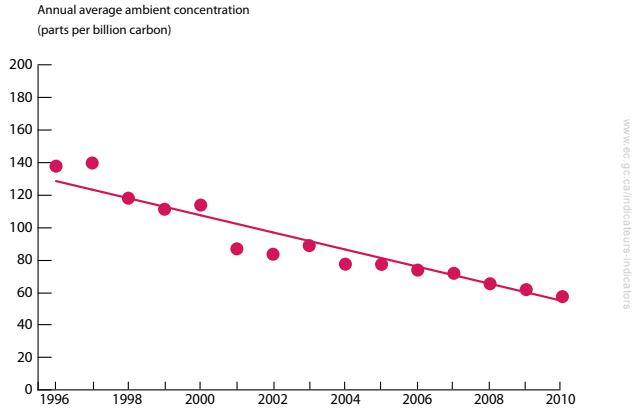


Figure 2.7: Volatile organic compounds concentrations, Canada, 1996 to 2010



Reducing air pollutant emissions

Target 2.1: Air Pollutants – *Reduce air pollutants in order to maintain or improve air quality across the country and achieve the emission targets which are currently under development in consultations with provinces and stakeholders.*

In 2010, air pollutant emissions were 18% to 57% lower than emission levels in 1990. Only ammonia emissions increased; they were 10% higher than the 1990 emission levels.

A proportion of cardiopulmonary mortality risk is attributable to air pollutants. No upward or downward trends have been observed for the mortality risk due to fine particulate matter, while it has grown slightly for ground-level ozone.

Clean Air Regulatory Agenda

In 2012, federal, provincial and territorial governments agreed to take further action to protect the health of Canadians and the environment with measures to improve air quality in Canada, through a comprehensive new Air Quality Management System (AQMS). This system will introduce new ambient air quality standards, provide a framework for managing air quality and the transboundary flow of air pollutants through local air zones and regional airsheds, and will establish emissions requirements for major industrial sectors and equipment types.

A key element of the AQMS is the establishment of new Canadian Ambient Air Quality Standards (CAAQS) for targeted air pollutants, which will drive the management of source emissions to improve health and environmental benefits. governments have agreed on new standards under the AQMS for fine particulate matter and ozone, the two main components of smog. Work has also begun on new standards for sulphur dioxide and nitrogen dioxide, which are significant components of air pollution. The completion and delivery of the Canadian Smog Science Assessment provided the scientific foundation for the development of CAAQS for fine particulate matter and ground-level ozone.

The AQMS will also establish Base Level Industrial Emissions Requirements to reduce the emissions from 13 industrial sectors and 4 types of equipment. These requirements are intended to apply to all facilities across Canada to ensure that they achieve good base-level performance. Additional local actions to reduce the emissions from transportation and other sources will be undertaken by the provinces and territories as part of air zone management in order to achieve the CAAQS.

The government has developed the Air Health Indicator (AHI) as a tool to monitor the impacts of outdoor air pollution exposure over time on the health of Canadians. The AHI also provides some of the input to inform the Air Quality Health Index (AQHI) and the Air Quality Benefits Assessment Tool. As of 2012, AQHI was available in all 10 provinces in 65 locations. Approximately 60% of Canadians now have access to the AQHI on a daily basis.

Multi-pollutant risk assessments were initiated for six industrial sectors (aluminium, pulp and paper, cement, coal-fired electricity, iron and steel, and base metal smelting). Data was collected on the type of pollutants being

released from each sector, and computer models were used to estimate the levels to which people would be exposed at different distances and directions from the point of release. The government also completed a biodiesel health risk assessment, which was used to inform recent renewable fuel regulations.

Clean Energy

The government supported strategic investments in the commercialization and adoption of clean energy technologies. These projects are helping the energy sector improve its air pollution emission performance by advancing clean electricity and cleaner energy production, increasing the production capacity and use of alternative fuels, and improving end-use energy efficiencies. For example, the Western Diversification Program provided funds to a power plant that will convert local renewable fuel sources to energy by means of a biomass gasification technology — the first of its kind in North America. As well, the ecoENERGY suite of programs supports increased production of low-impact renewable energy and helps Canadians reduce their energy use in all major end-use sectors.

The ecoENERGY suite of programs supports increased production of low-impact renewable energy and helps Canadians reduce their energy use in all major end-use sectors.

Canada has also furthered knowledge and communications in clean energy by researching demand for green jobs and skills, and participating in related international discussions.

Clean Transportation

Canada introduced regulations aligned with U.S. Environmental Protection Agency (EPA) standards to reduce air pollutant emissions from snowmobiles, personal watercraft, outboard motors and off-road motorcycles. For most products, the regulations took effect in the 2012 model year, but will be fully phased in by the 2015 model year. More stringent standards were implemented for off-road diesel engines, to be phased in between 2012 and 2025. The government is currently developing regulations to require an on-board diagnostic system for heavy-duty engines, to conform with U.S. standards. Vehicles and engines sold in Canada are subject to verification testing to assess compliance with air pollutant standards set out in regulations.

In 2010, the International Maritime Organization adopted the North American Emission Control Area (ECA), as proposed by Canada and the U.S. with the support of France, and which came into force on August 1, 2012. Large ships within the ECA are subject to more stringent air pollutant emission standards, and the ECA will reduce emissions of both nitrogen and sulphur oxides as well as fine particles from exhaust. To support the implementation of the ECA, new marine fuels standards were introduced in July 2012, as part of the *Canadian Environmental Protection Act, 1999 Sulphur in Diesel Fuel Regulations*.

The government has implemented a Memorandum of Understanding with the rail sector, and is developing air pollutant emission regulations for locomotives.

International

Canada continues to cooperate with the U.S. to address transboundary air pollution through the Canada-U.S. Air Quality Agreement (1991). The agreement addresses the transboundary movement of air pollutants that cause acid rain and smog. Both countries are in full compliance with their respective commitments, and emissions of these pollutants have decreased dramatically on both sides of the border. After more than 20 years of cooperation, emissions that cause acid rain have been reduced by more than 50%, and emissions causing smog by 40%, in the geographic area covered under this agreement.

After more than 20 years of cooperation, emissions that cause acid rain have been reduced by more than 50%, and emissions causing smog by 40%.

Under the newly formed Regulatory Cooperation Council, Canada and the U.S. have agreed to consider the expansion of the Canada-U.S. Air Quality Agreement to address transboundary particulate matter. Canada and the U.S. will work towards the completion of the necessary scientific, technical and regulatory foundations required to inform consideration of a Particulate Matter Annex to the agreement.

Canada also worked with the U.S. and Mexico to build further support for the North American proposal to phase down hydrofluorocarbons under the Montreal Protocol, in line with its objective to pursue an aligned climate change approach.

In addition, Canada participated in revising the Gothenburg Protocol, under the United Nations Economic Commission for Europe Convention on Long-Range Transboundary Air Pollution. It addresses transboundary air pollution in Europe and North America. The revised protocol, adopted in 2012, covers key air pollutants that contribute to the formation of acid rain, ozone and smog. The protocol was revised to set new commitments for 2020 and beyond for Parties to reduce emissions of nitrogen oxides, sulphur dioxide, ammonia (Europe only) and volatile organic compounds. It also adds commitments for particulate matter. The revised protocol breaks new ground in air pollution and climate policy in that it is the first international treaty to include black carbon (a short-lived climate pollutant).

For additional information on the implementation strategies that support this target, please consult the following websites: Aboriginal Affairs and Northern Development Canada, Agriculture and Agri-Food Canada, Atlantic Canada Opportunities Agency, Canada Economic Development for Quebec Regions, Environment Canada, Finance Canada, Foreign Affairs and International Trade Canada, Health Canada, Human Resources and Skills Development Canada, Industry Canada, National Research Council Canada, Natural Resources Canada, Transport Canada, and Western Economic Diversification Canada.

Progress Towards Target 2.1: *Air emissions of sulphur oxides, nitrogen oxides, volatile organic compounds, particulate matter, carbon monoxide and ammonia*

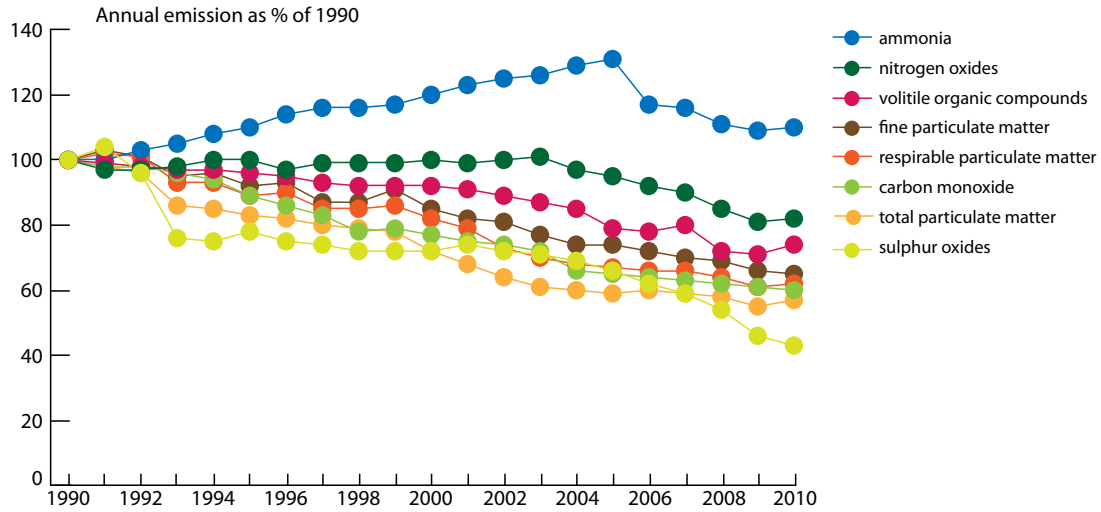
Comparing Canada's percentage of emissions reduction between 1999 and 2009 levels with nine other industrialized countries (U.S., France, Germany, United Kingdom, Italy, Russia, Japan, Australia, Sweden), Canada ranked sixth for sulphur oxides (SO_x) emissions (36% reduction), sixth for nitrogen oxides (NO_x) emissions (19% reduction), and fifth for volatile organic compounds emissions (21% reduction).

In 2010, air pollutant emissions were 18% to 57% lower than emission levels in 1990. Only ammonia (NH_3) emissions increased; they were 10% higher than the 1990 emission levels. Long-term emission levels of key pollutants are shown in Figure 2.8.

Canada's agricultural sector is a significant source of ammonia. The increase in emissions between 1990 and 2010 may be a result of the intensification of the agricultural sector. Ammonia is a critical plant nutrient. Ammonia emissions result from the use of nitrogen fertilizers and from livestock production. However, it is encouraging to note that the 2010 ammonia emissions from agriculture declined by almost 16% from their peak in 2005.

For more information on this indicator, please visit CESI.

Figure 2.8: Air pollutant emissions, Canada, 1990 to 2010



Progress Towards Target 2.1: *Trends in air quality related health outcomes*

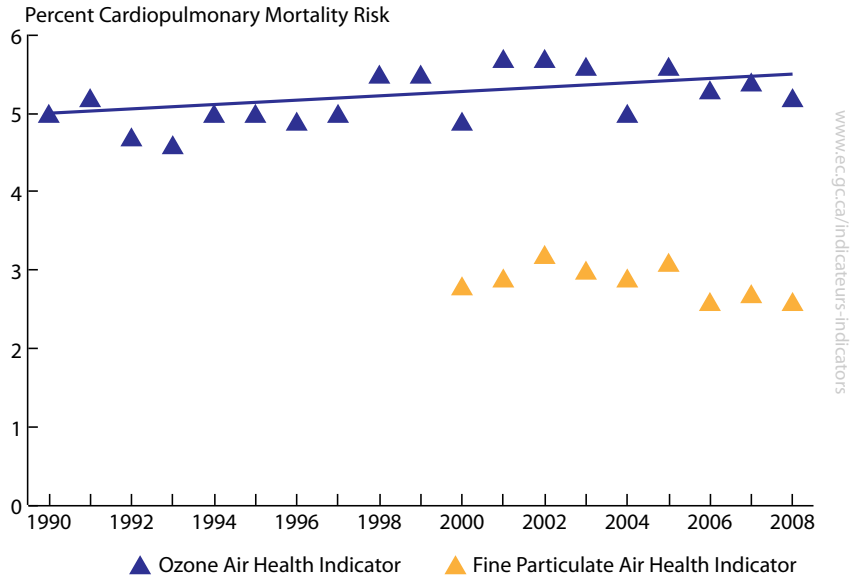
The Air Health Indicator (AHI) provides a view of the public health impacts attributable to outdoor air pollution in Canada.

The AHI monitors the percentage of all cardiopulmonary mortalities (deaths from heart- and lung-related diseases) that can be attributed to exposure to two important outdoor air pollutants: ground-level ozone and fine particulate matter ($PM_{2.5}$).

No upward or downward trends have been observed for the mortality risk due to $PM_{2.5}$, while it has grown slightly for ground-level ozone, as shown in Figure 2.9.

For the most up-to-date information on this indicator, please visit CESI.

Figure 2.9: Cardiopulmonary mortality risk attributable to ground-level ozone (1990 to 2008) and fine particulate matter exposure (2000 to 2008), Canada



Assessing and managing indoor air quality

Target 2.2: Indoor Air Quality – *Help protect the health of Canadians by assessing indoor air pollutants and developing guidelines and other tools to better manage indoor air quality.*

Canada has made investments in air quality assessment and management, including developing new Residential Indoor Air Quality Guidelines and other risk management activities to address indoor air pollutants. These include developing a radon health risk fact sheet for smokers, and performing a two-year survey of radon concentrations in 14 000 homes. The results of this survey indicate that approximately 7% of Canadian homes exceed the level of 200 becquerels per cubic metre, and the information is being used by stakeholders to identify and address areas of Canada more prone to high levels of radon.

Canada has also tested for radon in 2 000 federal buildings and applied the information to its database of indoor radon concentrations. By the end of 2012–2013, it is expected that more than 10 000 federal buildings will have been tested for radon.

Indoor air pollutants were also a primary focus of the "Hazardcheck: Hazards in your Environment" marketing and outreach campaign, which provided Canadians with advice on how to reduce their exposure to mould, carbon monoxide and radon. In addition, the government developed and implemented a health promotion campaign to enhance public awareness and knowledge of mould issues among First Nations.

For additional information on the implementation strategies and initiatives that support this target, please consult the following websites: Health Canada and National Research Council Canada.

Risk assessments were conducted and new Residential Indoor Air Quality Guidelines were developed for priority indoor pollutants toluene and fine particulate matter, including recommendations on how to reduce exposure and protect health. The final Residential Indoor Air Quality Guideline for toluene was issued, and the proposed fine particulate matter guideline was published for public comment.

Progress Towards Target 2.2: *Health-based assessments of priority indoor air pollutants and associated management tools*

In 2011, risk assessments were completed for naphthalene (a volatile organic compound released from some consumer products) and Legionella (a bacteria that causes Legionnaires disease, a rare and sometimes severe type of pneumonia).

Risk assessments were conducted and new Residential Indoor Air Quality Guidelines were developed for priority indoor pollutants toluene and fine particulate matter, including recommendations on how to reduce exposure and protect health. The final Residential Indoor Air Quality Guideline for toluene was issued, and the proposed fine particulate matter guideline was published for public comment. These residential indoor air quality guidelines join those previously issued for mould, formaldehyde, carbon monoxide, ozone and radon.

Reducing impacts of harmful substances

Target 2.3: Chemicals Management – *Reduce risks to Canadians and impacts on the environment posed by harmful substances as a result of decreased environmental concentrations and human exposure to such substances.*

The *Canadian Environmental Protection Act, 1999* requires that every new substance made in Canada or imported from other countries since 1994 be assessed against specific criteria to evaluate the risk they may pose to human health or the environment. However, many chemical substances already in use in Canada prior to this had not been assessed, but were grandfathered in and added to the Domestic Substances List (DSL). The 23 000 substances on the DSL then underwent a categorization process, whereby 4 300 substances requiring further attention were identified.

Since the launch of the Chemicals Management Plan in 2006, the government has worked closely with health and environment groups, consumer groups and industry to reduce risks to Canadians and the environment by setting clear priorities for the assessment and management of hundreds of chemicals. This integrated approach has allowed the government to address various routes of exposure to harmful substances by using the most appropriate management tools among a full suite of federal laws. Research and monitoring programs have also been integrated across departments so that efforts are focused on the highest priority work. As substances are assessed and tools for risk management actions are developed and taken, monitoring data will become available that will reflect progress in managing risks. This is an iterative and long-term process.

At the regional level, Canadian interests were represented at the Commission for Environmental Cooperation to address chemicals management. Globally, Canada worked with partners such as the European Chemicals Agency, the Organisation for Economic Co-operation and Development, and through the Stockholm Convention and the Convention on Long-range Transboundary Air Pollution. These engagements are critical to increase efficiencies so that foreign deposition of harmful substances can be reduced.

For additional information on the implementation strategies that support this target, please consult the following websites: Environment Canada, Health Canada, National Research Council Canada, Natural Resources Canada, and Aboriginal Affairs and Northern Development Canada.

Compared to 1990, mercury emissions to air in 2010 had decreased by 87% (30.3 tonnes). Since 2005, there has been a decline in hexavalent chromium emissions to air (70% reduction or 2.3 tonnes).

Baseline levels for Substances of Concern will be set in 2012–2013 based on data released in 2011–2012, which was collected in Cycle 1 of the Canadian Health Measures Survey (CHMS).

From 2007 to 2009, the level of exposure to mercury was 0.69 micrograms (µg) per litre (L) of blood, and exposure to lead was 13.4 µg/L of blood. The level of exposure to cadmium was 0.35 µg/L of blood, and to polybrominated diphenyl ethers (PBDE-47) was 0.06 µg/L of blood plasma. The biomonitoring data for the Canadian population, collected as part of Cycle 1 of the CHMS, is important in establishing baseline levels of chemicals in the Canadian population to enable the tracking of trends in exposures over time.

Progress Towards Target 2.3: *Canadian releases of selected controlled substances*

Compared to 1990, mercury emissions to air in 2010 had decreased by 87% (30.3 t). Since 2005, there has been a decline in hexavalent chromium emissions to air (70% reduction or 2.3 t).

In 2010, national mercury emissions totalled 4.7 t — an 18% (about 1.0 t) decrease from 2009 levels, as illustrated in Figure 2.10. The large decline in emissions since the 1990s is principally due to the adoption of various emission-reduction technologies in the non-ferrous smelting and refining sector, the closing of certain facilities, and compliance with federal and provincial legislation and guidelines introduced over that period. Emission reductions from improvements in fossil fuel-fired electricity generation and incineration also contributed to the decline.

In 2005, global mercury emissions to air from human activity were estimated to be 1 930 t. China contributed 42.8% (825.2 t) of the total, followed by India with 8.9% (171.9 t), and the United States with 6.1% (118.4 t). Canada emitted 6.2 t, which corresponded to 0.3% of the global mercury emissions to air in 2005.

Releases of hexavalent chromium from major emitting facilities in 2010 were 1.0 t (or 15%) lower than in 2009. This can be attributed to emission reductions in the Canadian manufacture of aerospace products and parts as well as glass and glass products. Figure 2.11 illustrates the downward trend in hexavalent chromium since 2005.

For the most up-to-date information on these indicators, please visit CESI (mercury, hexavalent chromium).

Figure 2.10: Mercury emissions to air, Canada, 1990 to 2010

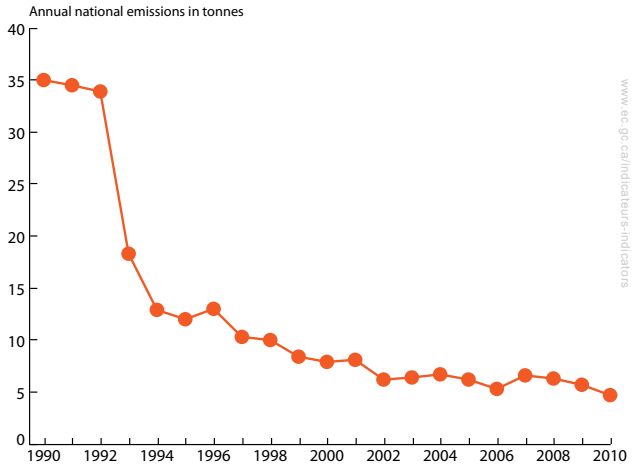
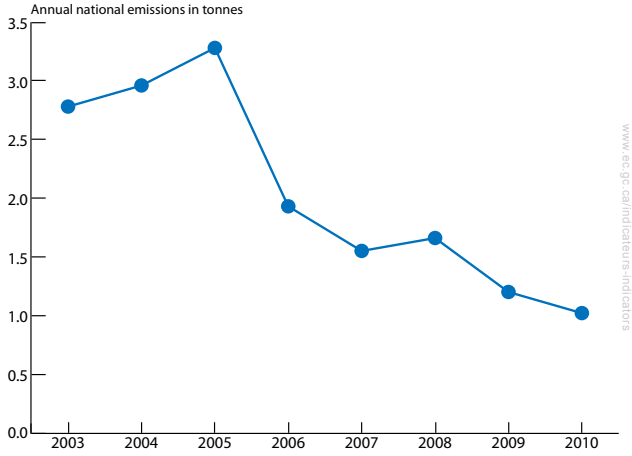


Figure 2.11: Hexavalent chromium emissions to air, Canada, 2003 to 2010



Progress Towards Target 2.3: *Levels of exposure to substances of concern by substance*

In August 2010, the government published its *Report on Human Biomonitoring of Environmental Chemicals in Canada,* which presents the first-ever comprehensive set of biomonitoring data for the Canadian population. In addition to establishing baseline levels of chemicals in the Canadian population, this 2010 report is important in advancing health surveillance and research, and assessing the effectiveness of actions by government and others in Canada.

Biomonitoring estimates how much of a chemical is present in a person, but the presence does not necessarily mean that it will cause a health effect. Factors such as the dose, the duration and timing of exposure, and the toxicity of the chemical are important in determining whether adverse health effects may occur.

Baseline levels for substances of concern will be set in 2012–2013, based on data released in 2011–2012, which was collected in Cycle 1 of the Canadian Health Measures Survey (CHMS).

From 2007 to 2009, the level of exposure to mercury was 0.69 micrograms (µg) per litre (L) of blood, and exposure to lead was 13.4 µg/L of blood. The level of exposure to cadmium was 0.35 µg/L of blood, and to polybrominated diphenyl ethers (PBDE-47) was 0.06 µg/L of blood plasma. The biomonitoring data for the Canadian population, collected as part of Cycle 1 of the CHMS, is important in establishing baseline levels of chemicals in the Canadian population to enable the tracking of trends in exposures over time.

Table 2.3 displays mercury, lead, cadmium and polybrominated diphenyl ether congener 47 (PBDE-47) concentrations in blood and blood plasma from 2007 to 2009.

Table 2.3: Mercury, lead, cadmium and polybrominated diphenyl ether (PBDE-47) concentrations in blood and blood plasma, Canada, 2007–2009

	Concentration (µg/L)	
Chemicals	Blood	Blood plasma
Mercury	0.69	–
Lead	13.4	–
Cadmium	0.35	–
PBDE-47	–	0.06

For the most up-to-date information on this indicator, please visit CESI.

SECTION 3

MAINTAINING WATER QUALITY AND AVAILABILITY

Overall, the national freshwater quality indicator has remained stable between 2003 and 2009.

Forty-one percent (41%) of monitoring stations rated water quality as either good or excellent for the 2007–2009 period.

The Great Lakes Areas of Concern are being restored.

Three Canadian Areas of Concern in the Great Lakes are fully restored (Collingwood Harbour, Severn Sound, Wheatley Harbour) and two more areas are in recovery (Spanish Harbour and Jackfish Bay).

Performance to Date

- Significant investments have been made to protect and restore key water bodies including the Great Lakes, Lake Winnipeg and Lake Simcoe, and progress in reducing nutrient loads is being made in these areas.
- In 2011, the Government of Canada signed a 15-year agreement with the Government of Quebec to continue their collaboration to protect and restore the health of the St. Lawrence River ecosystem.
- Through amendments to the Great Lakes Water Quality Agreement in 2012, the governments of Canada and the United States committed to a shared vision of a healthy and prosperous Great Lakes region in which the waters of the Great Lakes, through their sound management, use and enjoyment, provide benefits to present and future generations.
- In 2012, the governments of Canada and Alberta announced the Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring, a scientifically rigorous, comprehensive, integrated and transparent environmental monitoring program for the oil sands region.
- The Government of Canada put in place *Wastewater Systems Effluent Regulations* to phase out the release of untreated and undertreated sewage into waterways. This action addresses the largest point-source of pollution.
- There has been a significant reduction in oil discharges from marine vessels as a result of the National Aerial Surveillance Program covering all waters under Canadian jurisdiction.
- Between 2006 and 2013, the quality of water management in First Nations communities has improved as a result of significant investments in water and wastewater facility management.
- Since 2005, significant progress has been made in treating contaminated water and soil, and the removal of hazardous wastes at 1 400 sites across Canada.

Remaining Challenges

- Ecosystems in areas such as Lake Erie, Lake Winnipeg and the St. Lawrence River remain under stress from excess nutrients and other effects of human activity.
- Further efforts and improvements are required to monitor drinking water quality in First Nations communities.
- Eighteen percent (18%) of Canadians still rely on primary wastewater treatment alone.

Canada has relatively abundant access to fresh water.

Between 2001 and 2010, Canada's rivers typically had normal water quantity conditions.

The thermal-power-generation industry withdrew the most water annually between 2004 and 2009.

However, most of this water is reused, and most is eventually discharged back to the source.

Performance to Date

- Investment in water technologies in western Canada has the potential to significantly reduce the quantity of energy and water required to recover oil from the oil sands, and is helping to grow the western Canadian economy.
- Science and information is provided to support sustainable management of water resources, both groundwater and surface water.

Remaining Challenges

- Water use in Canada remains high — in 2009, the average Canadian used 274 litres of water per day.
- Urban growth, agriculture, expanding industrial activity and changing weather patterns place increasing pressure on water supply in some areas of Canada.

Why It Matters

Canada's rivers and lakes account for 7% of the world's renewable freshwater. Water is of major national environmental, social and economic value, as it protects ecosystem health, supplies drinking water and is critical for economic development, transportation, recreation and tourism. The manner in which water supplies are cared for and used affects both the quality and supply of this resource.

Multiple jurisdictions share responsibility for water quality and availability in Canada. Most responsibilities, including water management and protection, rest with the provinces and territories. The federal government works with the provinces and territories and other stakeholders to monitor the quality and supply of Canada's water in the areas of freshwater quality, marine water quality, drinking water quality, chemicals management and water resource management.

Water Quality

According to the Yale and Columbia University 2010 Environmental Performance Index, Canada has the best water quality ranking in the Americas. However, numerous factors, such as increased urbanization, agricultural production and releases of pollutants from industrial facilities, can decrease the quality of our water. Water is never pure — it picks up bits and pieces of everything it contacts, including minerals, silt, vegetation, fertilizers and agricultural run-off. This can lead to poor water quality and the consumption of poor-quality drinking water affects human health.

Ecosystems in areas such as Lake Erie, Lake Winnipeg and the St. Lawrence River remain under stress from excess nutrients and other effects of human activity.

In addition, the quality of Canada's water can be compromised when chemicals and toxic substances are released in the environment. The harmful effects of the toxic substances are known to affect human health, biological diversity and the overall environment. Industrial facilities and wastewater treatment plants are the primary sources of toxic substances released to water in Canada.

Canadians rely upon high water quality. For example, the Great Lakes basin supports 33 million people, including 9 million Canadians and 8 of Canada's 20 largest cities. This region makes up 40% of Canada's economic activity and each year contributes $180 billion to Canada-U.S. trade. The waters are used by 1.5 million recreational boaters and fishers.

Water Availability

Canada has relatively abundant access to freshwater, but the supply is not evenly distributed geographically or throughout the seasons. Water may not be abundant in the same areas where people live or work. For example, approximately 85% of Canadians live within 300 kilometres of the Canada-U.S. border, while 60% of Canada's freshwater drains to the north. In addition, groundwater provides up to 80% of the rural Canadian population's drinking water and is an essential component of ecosystem health.

Pressures on water availability include both natural causes such as weather cycles and human causes such as changes in land use, the building of dams and diversions, and industrial and individual use. According to a 2011 comparison by the Organisation for Economic Co-operation and Development, Canada ranked fourth in the amount of water removed from the environment. This includes water that was removed permanently and temporarily.

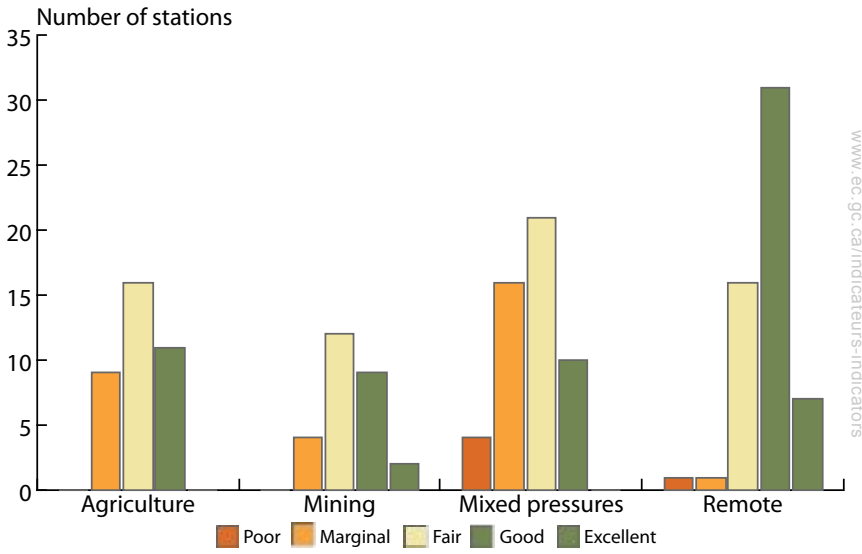
Influencing Factors on Freshwater Quality and Availability

Tracking pressures on Canada's water quality and quantity over time provides a better understanding of how to improve freshwater quality and availability. Some of the pressures on water quality and availability that can be influenced directly by Canadians include land use, use of chemical pesticides and residential water use.

Land Use

From 2007 to 2009, freshwater quality differed significantly according to land-use category as illustrated in Figure 3.1. Good and excellent freshwater quality was found more often in remote areas. Areas with more than one human development pressure (e.g., agriculture, mining) had more water quality monitoring stations with a poor or marginal freshwater quality ranking. For the most up-to-date information on this indicator, please visit CESI.

Figure 3.1: Freshwater quality by land-use category for the 2007 to 2009 period, Canada



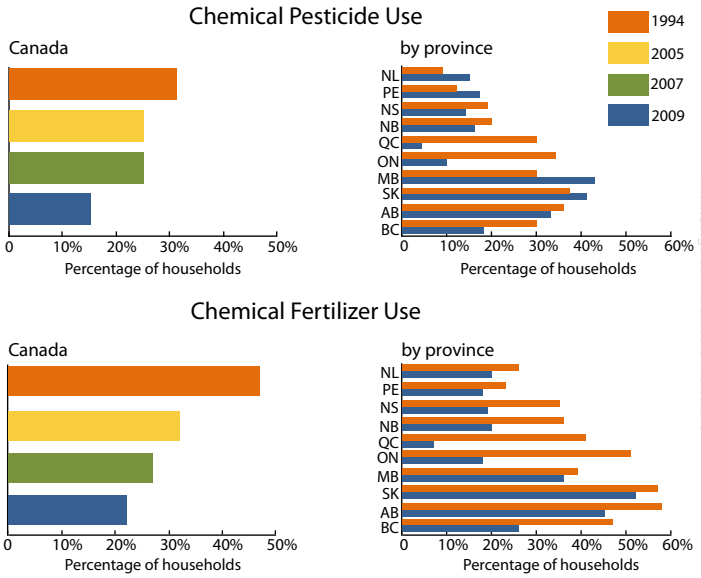
Household Use of Chemical Pesticides and Fertilizers

Since 1994, household use of chemical pesticide and fertilizer in Canada has declined.

In 2009, 15% of Canadian households with a lawn or garden used chemical pesticides compared to 31% in 1994. The largest decrease occurred in Quebec, where household chemical pesticide, use fell from 30% to 4%. The Prairie provinces, led by Manitoba, remained the region where household use of chemical pesticides was the most widespread. A 2006 cosmetic pesticide ban in Quebec and a similar 2009 ban in Ontario have likely contributed to the drop in pesticide use in these provinces between 1994 and 2009.

In 2009, 22% of Canadian households with a lawn or garden used chemical fertilizers, compared to 47% in 1994. The largest decreases occurred in Quebec and Ontario, while Quebec households were the lowest users of chemical fertilizers in 2009. Households in the Prairie provinces, led by Saskatchewan, used the most chemical fertilizer. For the most up-to-date information on this indicator, please visit CESI.

Figure 3.2: Percentage of households in Canada using chemical pesticides and fertilizers on lawns and gardens, 1994, 2005, 2007 and 2009, and by province for 1994 and 2009



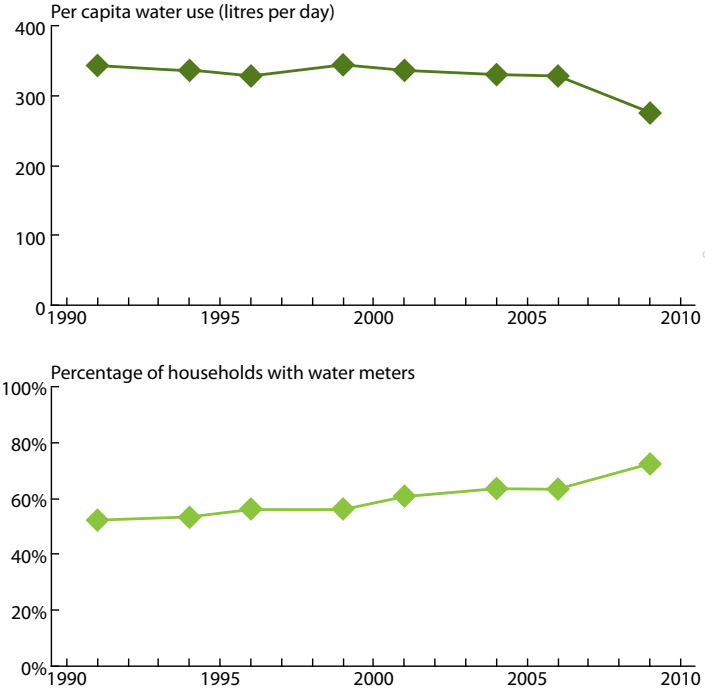
Residential Water Use

Urban growth, expanding industry and climate change put pressure on the ability of Canadian cities to supply water to households. Rising water demand, combined with the high costs of building and repairing water infrastructure, continues to make household water conservation a priority for many communities.

From 1991 to 2009, the average daily water use dropped from 342 L to 274 L per person, as illustrated in Figure 3.3. However, despite improvements in household water conservation, Canada remains one of the largest per capita users of fresh water in the world.

The second graph in Figure 3.3 illustrates that in 2009, 72% of Canadian households were equipped with water meters, an increase from 52% of households in 1991. In 2009, metered households on volume-based water pricing schemes used 39% less water per person than unmetered households on flat-rate water pricing schemes. For the most up-to-date information on this indicator, please visit CESI.

Figure 3.3: Households on metered water systems and per capita residential water use, Canada, 1991 to 2009



Enhancing Water Quality

Goal 3: Water Quality – *Protect and enhance the quality of water so that it is clean, safe and secure for all Canadians and supports healthy ecosystems.*

Progress Towards Goal 3: *Freshwater quality indicator for the protection of aquatic life (Water Quality Index)*

Overall, the national freshwater quality indicator remained stable between 2003 and 2009. For the period from 2007 to 2009, freshwater quality in rivers in populated regions of Canada was rated excellent or good at 71 monitoring stations (41%), fair at 67 stations (39%), marginal at 30 stations (17%) and poor at 5 stations (3%). Figure 3.4 demonstrates the freshwater quality ratings for the 2007 to 2009 period.

Factors affecting freshwater quality include the amount of pollution released directly into water and the amount of pollution from land and air that reaches water. Human activities, like urban growth, agricultural activities and industrial development, change how water moves across the land and can also directly pollute water. Freshwater quality is also affected by natural changes in rain and snowfall. These precipitation changes vary the amount of water runoff from the land and the pollutants transported to rivers, lakes and reservoirs. For the most up-to-date information on this indicator, please visit CESI.

Drinking Water Advisories

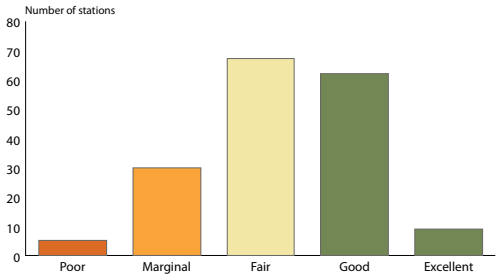
The government has been working to expand the adoption of a real-time, secure alerting and surveillance system that allows jurisdictions to track drinking water information, particularly boil-water advisories and their root causes. The system is fully developed and continues to adapt to meet the needs of drinking-water oversight agencies. Work continues with Canadian jurisdictions to support and enhance its use and provide expert assistance in this area. The system respects jurisdictional ownership of the information, but will provide Canada-wide information on the context and numbers of drinking-water advisories on a national basis, and will help characterize the needs of the drinking-water systems and communities affected. To date, six provinces/territories and two First Nations Regions have either fully implemented the system or are currently preparing to do so.

Information for this indicator will be available on the CESI website at a later date.

Overall, the national freshwater quality indicator has remained stable between 2003 and 2009.

For the period 2007 to 2009, freshwater quality was rated as excellent or good at 41% of stations, fair at 39% and marginal at 17%.

Figure 3.4: National freshwater quality indicator for 2007 to 2009, Canada



Improving the Great Lakes

Target 3.1: Freshwater Quality – *Complete federal actions to restore beneficial uses in Canadian Areas of Concern in the Great Lakes by 2020.*

Target 3.2: Freshwater Quality – *Contribute to the restoration and protection of the Great Lakes by developing and gaining binational acceptance of objectives and strategies for the management of nutrients in the Great Lakes by 2015.*

The Great Lakes provide the foundation for billions of dollars in economic activity and are a direct source of drinking water for millions of Canadians. However, the sustainability of the Great Lakes ecosystem is threatened from ongoing biological, physical and chemical stresses, as well as new and emerging challenges like invasive alien species, new chemical contaminants and the impacts of climate change.

In 1987, the Canada-United States Great Lakes Water Quality Agreement (GLWQA) identified 43 Areas of Concern (AOC) across the Great Lakes. An Area of Concern is a region that has experienced environmental degradation. Twenty-six of these AOCs are entirely in U.S. waters, 12 entirely in Canadian waters and 5 are in the channels connecting the lakes and are shared by both countries; thus, Canada has 17 AOCs to address.

In 2012, the governments of Canada and the United States amended the GLWQA and committed to a shared vision of a healthy and prosperous Great Lakes region in which the waters of the Great Lakes, through their sound management, use and enjoyment, provide benefits to present and future generations. This amended agreement reaffirms the commitment of Canada and the U.S. to addressing harmful algae, toxic chemicals, discharges from vessels and the clean-up of AOCs while also containing new provisions dealing with the nearshore environment, aquatic invasive species, habitat degradation and the effects of climate change.

The amended GLWQA also contains several key commitments to address the issue of phosphorus in the Great Lakes, which is of particular concern in Lake Erie. The agreement commits to develop binational substance objectives for phosphorus concentrations, loadings and targets for Lake Erie by 2015, and to have reduction strategies and actions plans in place to meet those objectives by 2017.

Additionally, in 2012 the Government of Canada committed $16 million over four years to the Great Lakes Nutrient Initiative to address nearshore water quality and aquatic ecosystem health, and toxic and nuisance algae growth in the Great Lakes. The Great Lakes Nutrient Initiative is determining the current nutrient loadings from selected Canadian tributaries, setting out binational lake ecosystem objectives, phosphorus objectives and

Environmental quality in Canada's Great Lakes Areas of Concern (AOCs) has improved since the restoration program began in 1987. Between 1987 and 2010, 3 out of 17 Canadian AOCs had their environmental conditions fully restored (Collingwood Harbour, Severn Sound, Wheatley Harbour) and 2 more areas are in recovery (Spanish Harbour and Jackfish Bay).

Phosphorus levels remain an issue in the open waters of three of the four Canadian Great Lakes.

Phosphorus levels in lakes Huron and Ontario and in Georgian Bay have declined below their water quality objectives, and the western and central basins of Lake Erie remain above their objectives.

Phosphorus levels in the middle of Lake Superior and in the eastern basin of Lake Erie currently meet their water quality objectives.

load reduction targets, developing policy options and strategies to meet those targets, and developing a nearshore assessment and management framework.

The government continues to implement its Comprehensive Approach to Clean Water through a number of concrete actions, including investments to clean up Canadian water bodies and a commitment of $48.9 million to clean up contaminated sediment, a key source of toxics in AOCs. In addition, the government provides annual funding of $8 million a year to support the remediation of other AOCs. These investments have supported partner projects to clean up contaminated sediment, restore fish and wildlife habitats, and improve wastewater treatment systems, along with scientific research, monitoring and provision of expertise to these projects.

As well, in 2007, the governments of Canada and Ontario signed a Memorandum of Understanding to establish a national marine conservation area in Lake Superior. Spanning more than 10 000 km^2, it will become the largest freshwater marine protected area in the world. Final steps are being taken to designate the area under the *Canada National Marine Conservation Areas Act*.

In addition, the Government of Canada is collaborating with the Government of Ontario and other stakeholders to set standards and complete mapping and assessment requirements for the Great Lakes region.

For additional information on the implementation strategies and initiatives that support this target, please consult the following websites: Environment Canada, Natural Resources Canada and Parks Canada.

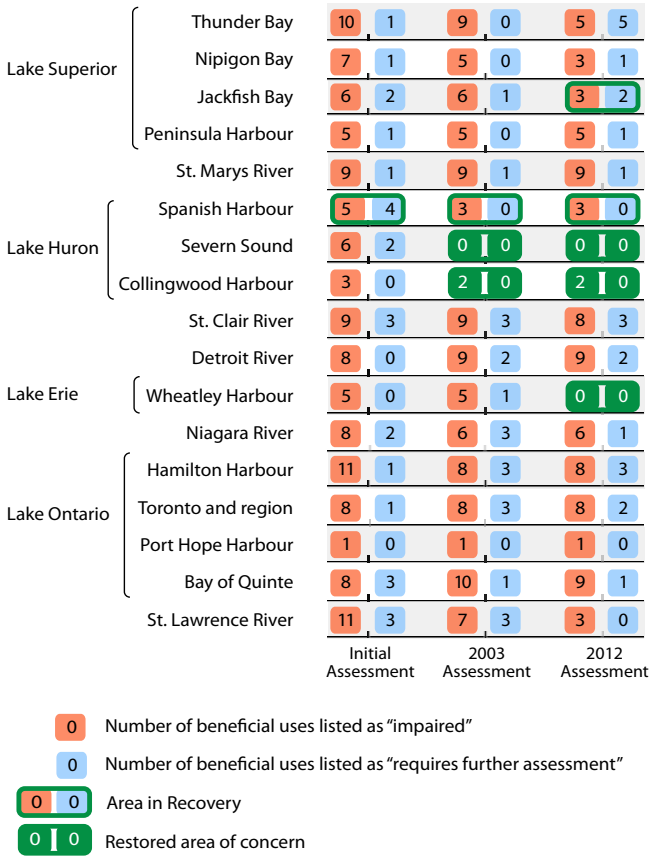
Progress Towards Target 3.1: *Environmental quality in canada's great lakes areas of concern*

Environmental quality in Canada's Great Lakes AOCs has improved since the restoration program began in 1987. Between 1987 and 2012, 3 out of 17 Canadian AOCs had their environmental conditions fully restored (Collingwood Harbour, Severn Sound, Wheatley Harbour) and 2 more areas are in recovery (Spanish Harbour and Jackfish Bay). An AOC may be designated an Area in Recovery when all remedial actions for the AOC have been implemented and environmental monitoring confirms that recovery is progressing in accordance with the remedial action plan.

The governments of Canada and Ontario have made significant achievements towards restoring beneficial uses in Canadian AOCs. As a result, many AOCs have improved to a degree that they no longer require significant attention. In May 2011, the Jackfish Bay AOC was designated an Area in Recovery. For Jackfish Bay, improvements in the local pulp and paper mill's effluent treatment and changes in industrial processes have achieved noted improvements in water and sediment quality. In 2012, the governments of Canada and Ontario announced their intention to support improvements to Hamilton Harbour.

Figure 3.5 shows the Great Lakes Area of Concern Indicator, noting the progress made towards restoring Canada's 17 AOCs. The indicator displays the number of beneficial uses that are either listed as "impaired" or "requires further assessment," and indicates whether the area is restored or in recovery. For each AOC, the decrease in the number of impaired beneficial uses shows progress toward restoration. For the most up-to-date information on this indicator, please visit CESI.

Figure 3.5: Progress on Great Lakes Areas of Concern 1987–2012



Progress Towards Target 3.2:
Phosphorus levels in the Great Lakes

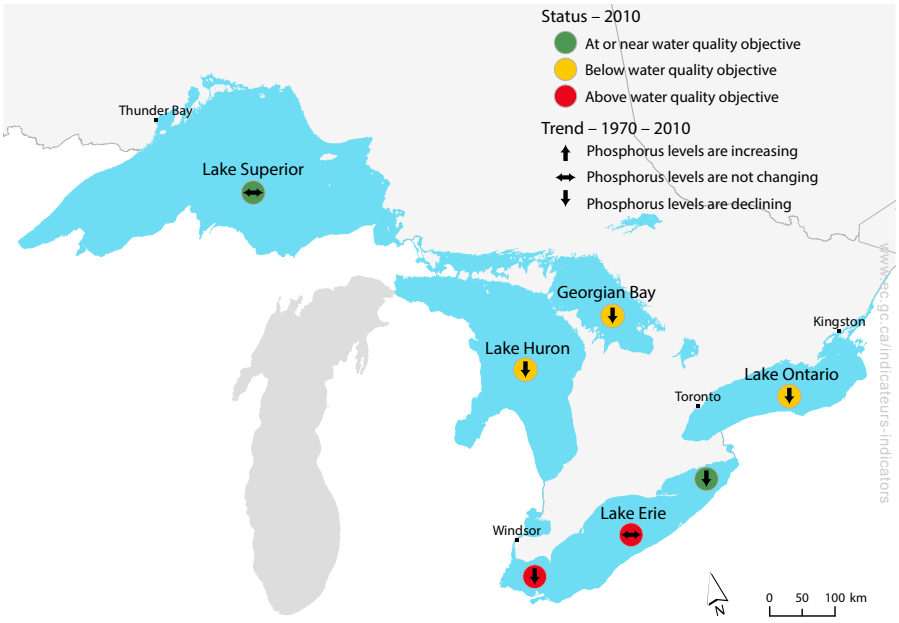
Phosphorus levels remain an issue in the open waters of three of the four Canadian Great Lakes.

Phosphorus levels in lakes Huron and Ontario and in Georgian Bay have declined below their water quality objectives, and the western and central bases of Lake Erie remain above objectives. Phosphorus levels in the middle of Lake Superior and in the eastern basin of Lake Erie currently meet their water quality objectives.

Phosphorus trends show that levels have not changed in Lake Superior or in the central basin of Lake Erie but are declining in other areas of the Great Lakes. An oversupply of phosphorus can cause nuisance plants and algae growth that can impair fish. Too little phosphorus can result in not enough plant growth to sustain fish.

Figure 3.6 shows the status and trends of phosphorus levels in the open water of the Canadian Great Lakes from 1970 to 2010. For the most up-to-date information on this indicator, please visit CESI.

Figure 3.6: Status and trends of phosphorus levels in the open waters of the Canadian Great Lakes, 1970 to 2010



Reducing nutrient pollution to the St. Lawrence River

Target 3.3: Freshwater Quality – *Complete federal actions to reduce pollutants and restore beneficial uses in hot spots in the St. Lawrence River by 2016.*

Through the St. Lawrence Action Plan, the governments of Canada and Quebec have reduced pollutants in the St. Lawrence River. Since 1988, the first 24 years of the Plan resulted in:

- A 96% reduction in toxic effluent discharges by 50 priority industrial plants;
- The establishment of the Saguenay-St. Laurent Marine Park;
- Protection of over 100 000 hectares (ha) of natural habitat; and,
- An improvement to approximately 50 wharfs and other marine infrastructures.

In 2011, the Government of Canada signed a 15-year agreement with the Government of Quebec to continue their collaboration to protect and restore the health of the St. Lawrence River ecosystem by renewing the St. Lawrence Action Plan until 2026. The action plan will support conservation and enhancement of the St. Lawrence River, maintain and develop science-based monitoring and prediction programs, and establish grounds for the integrated governance of the ecosystem.

The government regularly provides information to Canadians on the progress being made in the St. Lawrence River through reports and detailed fact sheets on environmental indicators showing the levels of pollutants in the St. Lawrence River.

For additional information on the implementation strategies that support this target, please consult the following website: Environment Canada.

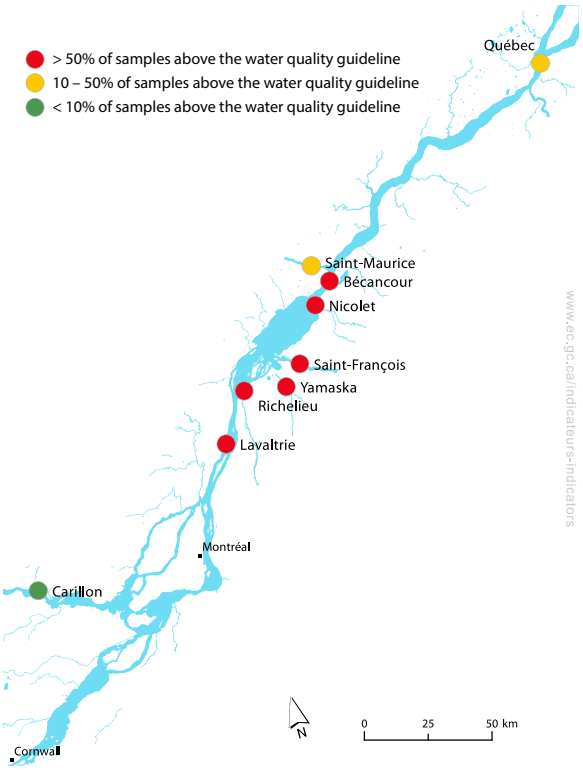
Phosphorus levels at six of nine water quality monitoring stations along the St. Lawrence River consistently exceeded water quality guidelines from 2008 to 2011. Higher phosphorus levels are found in agricultural areas on the south shore of Lake Saint-Pierre.

Progress Towards Target 3.3: *Phosphorus levels in the St. Lawrence River*

As the above actions indicate, the governments of Canada and Quebec continue to work on reducing pollutants in the St. Lawrence River. The challenge is significant and continued efforts are required. Phosphorus levels at six of nine water quality monitoring stations along the St. Lawrence River consistently exceeded water quality guidelines from 2008 to 2011. Higher phosphorus levels are found in agricultural areas on the south shore of Lake Saint-Pierre.

Figure 3.7 shows phosphorus levels in the St. Lawrence River for 2008 to 2011. For the most up-to-date information on this indicator, please visit CESI.

Figure 3.7: Phosphorus levels in the St. Lawrence River for 2008–2011



Reducing nutrient pollution to Lake Simcoe

Target 3.4: Freshwater Quality – *Reduce nutrient inputs into Lake Simcoe by 2012.*

Beginning in 2008, the government has dedicated $30 million to the Lake Simcoe Clean-Up Fund. The fund has contributed to 160 projects to reduce phosphorus inputs in an effort to restore the lake's ecological integrity and coldwater fishery. Phosphorus-reduction projects included stream-bank erosion-control measures, stewardship programs, projects to stop livestock from directly accessing water courses, manure storage, planting trees and plants along river corridors, projects to contain milkhouse washwater, stormwater pond retrofits, and building engineered wetlands.

For additional information on the implementation strategies that support this target, please consult the following website: Environment Canada.

As of March 2012, stewardship projects supported by the Lake Simcoe Clean-Up Fund were preventing an estimated 2900 kilograms of phosphorus per year from reaching Lake Simcoe and its rivers.

Progress Towards Target 3.4: *Nutrient reductions in Lake Simcoe*

As of March 2012, stewardship projects supported by the Lake Simcoe Clean-Up Fund were preventing an estimated 2 900 kilograms (kg) of phosphorus per year from entering the Lake Simcoe watershed, as illustrated in Table 3.1. This estimated reduction to Lake Simcoe's watershed contributes to Ontario's long-term goal of reducing phosphorus loading to the lake itself by 28 000 kg of phosphorus per year.

Table 3.1: Estimated phosphorus reduction as a result of completed Lake Simcoe Clean-Up Fund beneficial management projects completed by March 2012

Project Type	Estimated Phosphorus Reduction (kg P/yr)
Rural sources	400
Agricultural sources	1300
Urban runoff and storm water	1200
Total	**2900**

For the most up-to-date information on this indicator, please visit CESI.

Reducing nutrient pollution to Lake Winnipeg

Target 3.5: Freshwater Quality – *By 2012, through strategic collaborations and by increasing scientific knowledge, contribute to the establishment of targets to reduce nutrients in Lake Winnipeg and its basin to support the sustainability of the lake.*

Targets to reduce nutrients in Lake Winnipeg and its basins were established in 2011.

Since 2008, almost $18 million has been invested in the Lake Winnipeg Basin Initiative to support 33 projects throughout the watershed to help restore the ecological integrity of Canada's sixth largest lake. Projects include agricultural beneficial management practices, wetland and riparian restoration, and demonstration projects to reduce nutrient pollution.

In September 2010, the governments of Canada and Manitoba signed a five-year Canada-Manitoba Memorandum of Understanding to coordinate collaboration. In June 2011, the Province of Manitoba passed the *Save Lake Winnipeg Act*. This Act implements a number of initiatives, including regulations, as part of a plan to reduce the phosphorus load to Lake Winnipeg by 50% to pre-1990 levels. Scientific studies, collaborations and knowledge sharing between the federal government and Manitoba Water Stewardship supported the development of this legislation.

In 2012, the federal government announced support for the second phase of the Lake Winnipeg Basin Initiative (2012–2017).

For additional information on the implementation strategies that support this target, please consult the following website: Environment Canada.

Progress Towards Target 3.5: *Nutrient objectives indicator for Lake Winnipeg*

This target has been achieved, as targets to reduce nutrients in Lake Winnipeg and its basins were established in 2011.

Future indicators of efforts to reduce nutrient pollution to Lake Winnipeg will make use of the approach used in the Great Lakes and St. Lawrence. Information for this indicator will be available on the CESI website at a later date.

Reducing agricultural impacts on the environment

Target 3.6: Freshwater Quality – *Achieve a value between 81–100 on each of the water quality and soil quality agri-environmental performance indices by march 31, 2030.*

In 2006, the Water Quality Agri-Environmental Performance Index was rated as good (78); however, it has declined (by 7 points) from the desired level. The Soil Quality Agri-Environmental Performance Index was 77 (in 2006), an improvement from 2001 (by 3 points).

The government undertakes research and provides information on the impact of agricultural activities on the environment, including the effects of nutrients, pesticides and the use of water resources.

The Growing Forward agriculture policy, a five-year federal/provincial/territorial initiative, provides flexible programs that adapt to meet regional needs while achieving common national goals. The policy modernizes regulatory processes to support a competitive and innovative agricultural sector, and provides simple and accessible programs and services to help farms assess priority environmental risks. For example, each producer is required to complete a full risk assessment on operations prior to accessing funding for the implementation of environmental Beneficial Management Practices (BMPs).

To determine the impact of activities under policy frameworks like Growing Forward, the government has developed a set of science-based agri-environmental indicators that integrate information on soils, climate and topography with statistics on land use and crop and livestock management practices. Programming under this initiative serves to determine the impacts achieved from the implementation of BMP activities mentioned above.

For additional information on the implementation strategies that support this target, please consult the following websites: Agriculture and Agri-Food Canada, and Environment Canada.

Progress Towards Target 3.6: *Agri-environmental performance indices for soil and water quality*

High ratings of the agri-environmental performance indices mean that, overall, Canadian farmers are working in a manner that protects the environment.

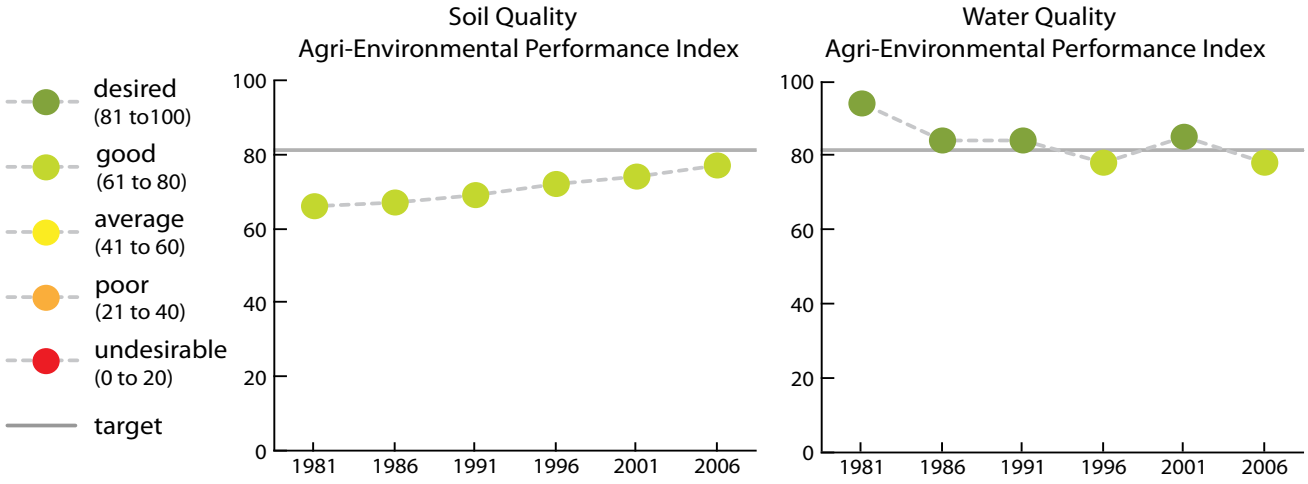
In 2006, the Water Quality Agri-Environmental Performance Index was rated as good (78); however, it has declined by 7 points from the desired level. The Soil Quality Agri-Environmental Performance Index was 77 (in 2006), an improvement from 2001 by 3 points. These soil and water ratings are displayed in Figure 3.8.

These high ratings on the agri-environmental performance indices mean that, overall, Canadian farmers are working in a manner that protects the environment.

The decline of the Water Quality Agri-Environmental Performance Index at the national level was due to increased application of nutrients (nitrogen and phosphorus) as fertilizers and manures on farms. In areas of higher precipitation, increased water flow through the soil increases runoff from land where pesticides and fertilizers were applied and can result in poorer water quality in receiving waters.

The improvement shown in the Soil Quality Agri-Environmental Index was largely due to adoption of reduced-till or no-till farming practices, particularly in the western provinces. In eastern Canada, where higher rainfall supports more intensive crop production and tillage practices are more conventional than in the West, soils may be more affected by agricultural practices. For the most up-to-date information on this indicator, please visit CESI.

Figure 3.8: Agri-environmental performance indices for soil and water quality in Canada, 1981–2006



Reducing wastewater pollution

Target 3.7: Freshwater Quality – *Reduce risks associated with wastewater effluent by 2020 in collaboration with provinces and territories (Note: risk reduction for wastewater effluent relates both to freshwater and marine).*

The federal government has worked with all levels of government and through the Canadian Council of Ministers of the Environment to finalize the *Wastewater Systems Effluent Regulations* (WSER) in 2012. The regulations will phase out the release of untreated and undertreated sewage into waterways, and align Canadian standards with those of the United States and the European Union. It is expected that about 75% of existing wastewater systems already meet the minimum secondary wastewater treatment standards in the regulations. Communities and municipalities, including First Nations, that meet the standards will not need to make upgrades to their systems. The other 25% will have to upgrade to at least secondary wastewater treatment. Wastewater systems requiring upgrades will have until the end of 2020, 2030 or 2040, based on risk, to achieve the effluent quality standards.

For additional information on the implementation strategies that support this target, please consult the following website: Environment Canada.

The percentage of Canadians on municipal sewers with secondary wastewater treatment or better has improved from 40% in 1983 to 69% in 2009.

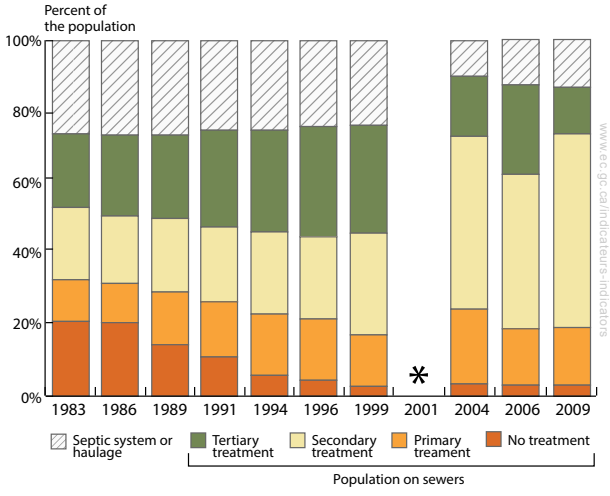
Beginning in 2013, the loading of Biological Oxygen Demand matter and suspended solids for all wastewater systems subject to the *Wastewater Systems Effluent Regulations* will be tracked, and a baseline for reporting will be established in 2015.

Progress Towards Target 3.7: *Municipal wastewater treatment (interim indicator)*

The percentage of Canadians on municipal sewers with secondary wastewater treatment or better has improved from 40% in 1983 to 69% in 2009, as shown by Figure 3.9. This leaves approximately 18% of Canadians who rely on primary treatment or less, and another 13% of Canadians using household septic systems to treat their sewage.

For the most up-to-date information on this indicator, please visit CESI.

Figure 3.9: Wastewater treatment levels, Canada, 1983 to 2009



* Data from the 2001 survey were not included, as there were not enough respondents to produce meaningful results.

Future Indicators

By 2015, those wastewater systems achieving and not achieving the effluent quality standards will be tracked through an online, electronic reporting system.

Beginning in 2013, the loading of Biological Oxygen Demand matter and suspended solids for all wastewater systems subject to the WSER will be tracked through an online, electronic reporting system. The baseline for reporting on this indicator (and the indicator above) will be established in 2015. Information for these indicators will be available on the CESI website at a later date.

Reducing pollution from land-based activities and disposal at sea

Target 3.8: Marine Water Quality – *Reduce the risks to Canadians and impacts on the marine environment posed by pollution from land-based activities*.

Target 3.9: Marine Water Quality – *Prevent marine pollution from uncontrolled dumping at sea. Ensure that permitted disposal at sea is sustainable such that 85% of disposal site monitoring events do not identify the need for site management action (such as site closure).*

In 2010, 73% of Canada's shellfish growing area was classified as approved or conditionally approved for shellfish harvesting for human consumption. From 2006 to 2010, the percentage of approved and conditionally approved growing areas did not change.

The federal government has taken action to reduce the risks posed by pollution, such as spills and disposal practices from both land-based activities and uncontrolled dumping at sea. It ensures compliance with the *Canada Shipping Act, 2001*, the *Arctic Waters Pollution Prevention Act*, the *Marine Liability Act*, as well as international conventions in order to protect the marine environment. This includes regulating exchange and discharge of ballast water, and contributing to setting domestic and international rules that govern liability limits of marine pollution incidents.

In addition, regular aerial surveillance over all waters under Canadian jurisdiction through the National Aerial Surveillance Program has contributed significantly to the decrease in oil discharges from marine vessels, as ships are increasingly aware that their illicit polluting activities can be detected.

Between 2001 and 2010, the percentage of permitted disposal at sea sites requiring no management action has been above Environment Canada's target of 85%.

Except for 2005, no management actions were required between 2001 and 2010.

At the international level, Canada's engagement on marine pollution has led to stronger protection of the marine environment from both ships' pollution and the introduction of invasive alien species, beginning in 1972 with the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter. In 2001, Canada ratified the International Convention on the Control of Harmful Anti-fouling Systems on Ships. This was followed in 2004 with ratification of the International Convention for the Control Management of Ships Ballast Water and Sediments.

For additional information on the implementation strategies that support this target, please consult the following websites: Environment Canada and Transport Canada.

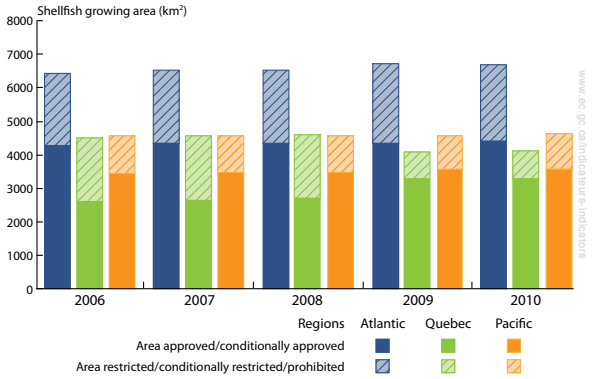
Progress Towards Target 3.8: *Classifications of Canada's shellfish growing areas*

In 2010, 73% of Canada's shellfish growing area was classified as approved or conditionally approved for shellfish harvesting for human consumption, as illustrated in Figure 3.10. From 2006 to 2010, the percentage of approved and conditionally approved growing areas did not change.

On the Atlantic coast, 66% of the shellfish growing area was approved for shellfish harvest or conditionally approved, compared to 80% on the Quebec coast and 77% on the Pacific coast. While there can be local, short-term closures due to storms or other events, the results show that Canada's shellfish growing areas are stable overall.

For the purposes of the Shellfish Growing Area Quality Indicator, shellfish are oysters, clams, geoduck clams, mussels, scallops and cockles. Government conducts bacterial testing of waters in shellfish growing areas under the Canadian Shellfish Sanitation Program to reduce the chance that people will get sick from eating shellfish collected in the wild or grown in aquaculture. To determine if shellfish are safe to eat, each growing area is monitored and classified as approved, conditionally approved, restricted, conditionally restricted or prohibited for fishing based on the concentration of bacteria in the water and the effects of pollution sources such as municipal wastewater discharge or boating activities.

Figure 3.10: Classifications of Canada's shellfish growing areas, 2006 to 2010



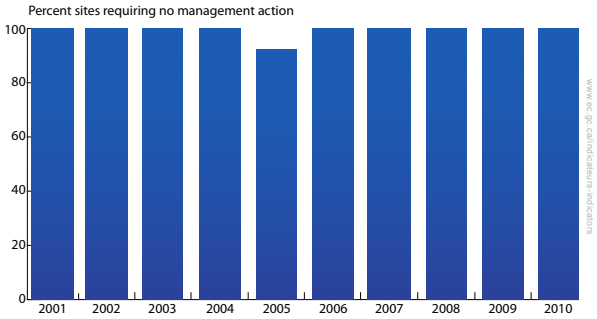
For the most up-to-date information on this indicator, please visit CESI.

Progress Towards Target 3.9: *Disposal at sea*

Disposal at sea is the deliberate discarding of approved material from a ship, aircraft, platform or other structure at sea. Disposal of any substance at sea is illegal without a permit.

Between 2001 and 2010, the percentage of permitted disposal at sea sites requiring no management action has been above the target of 85%, as shown in Figure 3.11. Except for 2005, no management actions were required between 2001 and 2010. Canada's ocean disposal sites are being used in a sustainable manner, and impacts to the sites are occurring as predicted.

Figure 3.11: Monitored disposal at sea sites requiring no management action, 2001 to 2010



For the most up-to-date information on this indicator, please visit CESI.

Improving water and wastewater treatment in First Nations communities

Target 3.10: Drinking Water Quality – *Increase the percentage of First Nation communities with acceptable water and wastewater facility risk ratings by 2013.*

Access to safe drinking water is a crucial requirement for all Canadians. The federal government has taken action to improve access to safe water in First Nation communities and to protect the health of all Canadians by working with the provinces to develop health-based water guidelines. Between 2006 and 2013, the Government of Canada will have invested $2.5 billion in water and wastewater infrastructure in First Nations.

Investments have included the development of new water and wastewater systems, upgrades to existing systems, system repairs, feasibility studies, and other related activities. The government is committed to providing safe, clean drinking water in all First Nations communities, and to ensuring that wastewater services meet acceptable effluent quality standards. The goal of these efforts is to improve the management of water and wastewater systems in First Nations communities.

Between 2009 and 2011, the government conducted the National Assessment of First Nations Water and Wastewater Systems for 571 participating First Nations. These systems were rated based on inspections of their management of water and wastewater systems (e.g., operation, design, operator certification, reporting and source water quality). This assessment was followed up in 2011–2012, when 771 water systems and 519 wastewater treatment systems were inspected in 545 First Nations communities.

For additional information on the implementation strategies that support this target, please consult the following websites:
Aboriginal Affairs and Northern Development Canada, Environment Canada and Health Canada.

Comparing the results of the 2011 National Assessment with the 2012 Annual Performance Inspections, the risk rating of First Nations water and wastewater systems is improving.

The percentage of water systems: low-risk systems increased from 25.2% to 34.5% and high-risk systems have decreased from 34.8% to 26.7%.

The percentage of wastewater systems: low-risk systems increased from 31.2% to 45.1% and high-risk systems have decreased from 13.3% to 11.2%.

Progress Towards Target 3.10: *First Nation communities with acceptable water and wastewater facility risk ratings*

In June 2012, systems assessed as part of the Annual Performance Inspection were compared to those of the 2011 National Assessment. Improvements in ratings were found.

For water systems, the percentage of high-risk systems has decreased from 34.8% to 26.7%, and the percentage of low-risk systems has increased from 25.2% to 34.5%.

For wastewater systems, the percentage of high-risk systems has decreased from 13.3% to 11.2%, and the percentage of low-risk systems has increased from 31.2% to 45.1%.

For more information, please consult the following website:
Aboriginal Affairs and Northern Development Canada.

Protecting Canadians' drinking water

Target 3.11: Drinking Water Quality – *Help protect the health of Canadians by developing health-based water guidelines.*

Since 1968, guidelines and guidance documents on drinking water have been developed and published. While provinces and territories help set priorities, provide exposure data, and approve and apply guidelines, federal leadership in the Guidelines for Canadian Drinking Water Quality ensures national consistency and economy of scale, with the scientific expertise required for health assessments. The federal/provincial/territorial Committee on Health and the Environment provides policy approval from their respective jurisdictions.

The guidelines provide the foundation of every drinking water regulation and requirement in Canada, and provide health-based limits and guidance for over 80 microbiological, chemical and radiological contaminants in drinking water. Through the development of new guidelines and the updating of older ones, the system keeps up with new scientific developments, as well as emerging contaminants of concern.

For additional information on the implementation strategies that support this target, please consult the following websites: Environment Canada and Health Canada.

Four guidelines/guidance documents pertaining to drinking water quality have been approved by the federal/provincial/territorial Committee on Health and the Environment. These were guidelines on: Protozoa; E. coli; Total Coliform; and, guidance for Heterotrophic Plate Count.

Progress Towards Target 3.11: *Health-based water guidelines*

Four guidelines/guidance documents pertaining to drinking water quality have been approved by the federal/provincial/territorial Committee on Health and the Environment. These were guidelines on protozoa, E. coli, total coliform and guidance for heterotrophic plate count.

Reducing impacts of harmful substances in water

Target 3.12: Chemicals Management – *Reduce risks to Canadians and impacts on the environment posed by harmful substances as a result of decreased environmental concentrations and human exposure to such substances.*

Since 2006, Canada has worked closely with health and environmental groups, consumer groups and industry through the Chemicals Management Plan (CMP) to reduce risks to Canadians and the environment by setting clear priorities for the assessment and management of hundreds of chemicals.

The CMP has made Canada a world leader in chemicals management. One key initiative resulted in the prohibition of the manufacture, use, sale, offer for sale and import of products containing harmful substances used in foams for firefighting and in some textiles. The CMP has also implemented requirements for pollution prevention for 4 substances that are used in industrial processes, and has added 22 substances to the Cosmetic Ingredient Hotlist.

In October 2011, the government announced more than $506 million in funding over 5 years for the next phase of the CMP, which includes improving product safety, chemical research and completing assessments of 500 substances including those used in plastics. Integrated monitoring is another important aspect of the CMP that over time will yield important information on progress.

In addition, from 2005 to 2011, the government made significant progress in remediating contaminated sites during Phase I of the Federal Contaminated Sites Action Plan. From an original inventory of 6200 sites and other sites identified in Phase I, remedial actions were taken on 1400 sites. Contaminated water and soil were treated and hazardous wastes destroyed.

In 2012, the governments of Canada and Alberta announced the Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring, a scientifically rigorous, comprehensive, integrated and transparent environmental monitoring program for the oil sands region. It outlines the path forward to enhance the monitoring of water, air, land and biodiversity that will result in improved knowledge of the state of the region's environment and enhanced understanding of cumulative effects and environmental change. These methods and results will be made public to allow independent scientific assessments and evaluations. The announcement built on monitoring plans released in 2011.

In 1991, the Northern Contaminants Program was established to reduce contaminants in country foods harvested in the North. Since then, global

From 2007–2010, levels of polybrominated diphenyl ethers (PBDEs) in fish and sediments were below the Federal Environmental Quality Guidelines in the majority of drainage regions in Canada.

Exceedances in fish have occurred; mainly for pentaBDEs in most drainage regions and for tetraBDE in one drainage region.

Exceedances in sediment have occurred for pentaBDE and decaBDE in 4 out of 10 sample drainage regions.

The amount of mercury, cadmium and lead released to water was lower in 2010 than in 2003.

The Chemicals Management Plan has made Canada a world leader in chemicals management.

management and monitoring has led to a 40% decrease on average of persistent organic pollutants in northern fish and wildlife. The decrease in these contaminants in fish and wildlife, together with dietary changes, has contributed to an approximately 60% decrease in contaminant exposure among northern populations.

For additional information on the implementation strategies that support this target, please consult the following websites: Environment Canada, Health Canada, and Aboriginal Affairs and Northern Development Canada.

Progress Towards Target 3.12: *Concentrations of selected substances (PFOS and PBDE) in water*

Polybrominated diphenyl ethers (PBDEs) are a group of chemicals used as flame retardants that are considered dangerous for wildlife. PBDEs are persistent organic pollutants (POPs) such that they build up in living organisms, remain in the environment for long periods after their release and are capable of long-range transport.

PBDEs are considered high-priority chemicals under the CMP. Currently, the use of PBDEs in Canada is declining because most commercial mixtures containing these chemicals have either been voluntarily phased out by manufacturers or are subject to restrictions in Canada. In addition, Canada is also engaged in two international agreements that restrict and ultimately target the elimination of the production, use, trade, release and storage of PBDEs.

Despite these efforts, long-range transport of PBDEs to Canada, potential presence in imported products, widespread use in the past and slow breakdown following release mean that PBDEs still remain in the Canadian environment.

Indicators have been developed to report on PBDEs. The PBDEs in Fish and Sediment indicators report on the occurrence of PBDE concentrations above or below Federal Environmental Quality Guidelines (FEQGs) in both fish tissue and sediment. FEQGs are numerical limits established under the CMP to protect aquatic life. Concentrations below the guidelines are not of concern, while concentrations above guidelines indicate that further evaluation may be required.

From 2007–2010, levels of PBDEs in fish and sediments were below the FEQGs in the majority of drainage regions in Canada. Exceedances in fish have occurred; mainly for pentaBDEs in most drainage regions and for tetraBDE in one drainage region. Exceedances in sediment have occurred for pentaBDE and decaBDE in 4 out of 10 sample drainage regions.

PBDEs in Fish

Between 2008 and 2010, the government conducted fish sampling in 11 drainage regions, and analysed PBDEs concentrations in fish tissue of 4 sub-groups for which guidelines have been set: triBDE, tetraBDE, pentaBDE and hexaBDE. The analysis found that concentrations of triBDE, tetraBDE and hexaBDE in most drainage regions were below the guidelines. However, levels of tetraBDE in the Great Lakes and pentaBDE in almost all the drainage regions exceeded the guidelines levels.

PBDEs in sediment

Between 2007 and 2010, the government conducted sediment sampling in 10 drainage regions, and analysed sediment concentrations for 6 sub-groups of PBDEs that have guidelines. The analysis found that sediment samples from the Pacific coastal, the Great Lakes and the St. Lawrence drainage regions had pentaBDE and decaBDE concentrations above FEQGs. Sediment from the Lower Saskatchewan–Nelson drainage region had only total pentaBDE above guideline levels. All other sub-groups of PBDEs were below the guidelines for all regions where sampling occurred.

Overall, concentrations of PBDEs show evidence of a decline in environmental media such as fish and sediment. However, due to their persistent nature, susceptibility to long-range transport and presence in imported products, it will take some time to eliminate PBDEs from the Canadian environment.

Through comparison to the FEQGs for PBDEs, data suggest that concentrations of most forms in most regions of Canada present a low potential for adverse effects on the organisms examined in this monitoring program. These results provide an important piece of information to be used by the Government of Canada in evaluating its risk management strategy for PBDEs.

For the most up-to-date information on this indicator, please visit CESI.

Progress Towards Target 3.12: *Mercury, cadmium and lead released to water*

Mercury, cadmium and lead are naturally occurring metals; however, they can also be released directly to water from human activities such as sewage treatment, production of pulp and paper, and processing of metals for products or industrial uses.

As shown in figures 3.12, 3.13, and 3.14, in Canada the amount of mercury, cadmium and lead released to water was lower in 2010 than in 2003. In 2010, the amount released was reduced from 2003 levels by 29% or 112 kg for mercury, by 22% or 5453 kg for lead and by 46% or 2275 kg for cadmium.

For the most up-to-date information on these indicators, please visit CESI (mercury, cadmium, lead).

Figure 3.12: Mercury release to water, 2003 to 2010

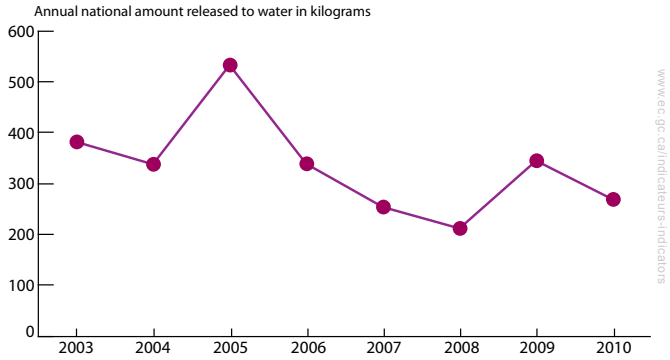


Figure 3.13: Cadmium release to water, 2003 to 2010

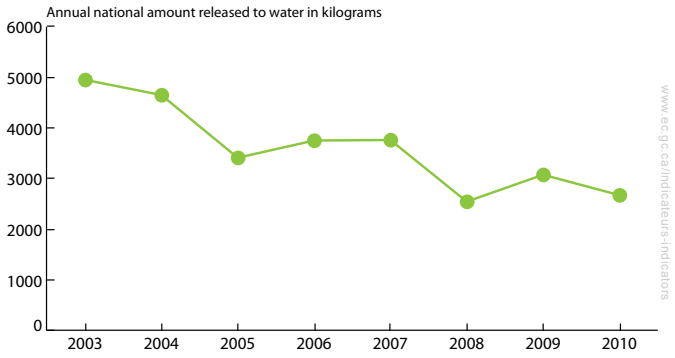
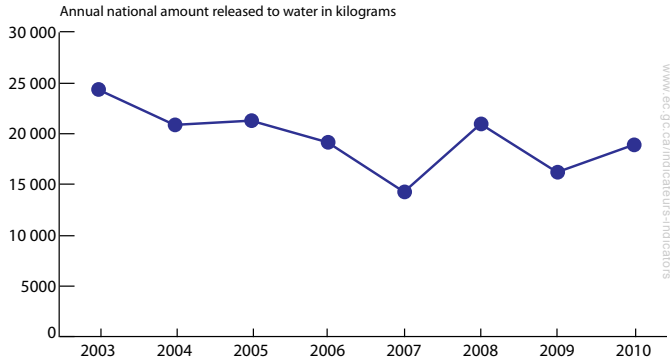


Figure 3.14: Lead release to water, 2003 to 2010



Enhancing Water Availability

Goal 4: Water Availability – *Enhance information to ensure that Canadians can manage and use water resources in a manner consistent with the sustainability of the resource.*

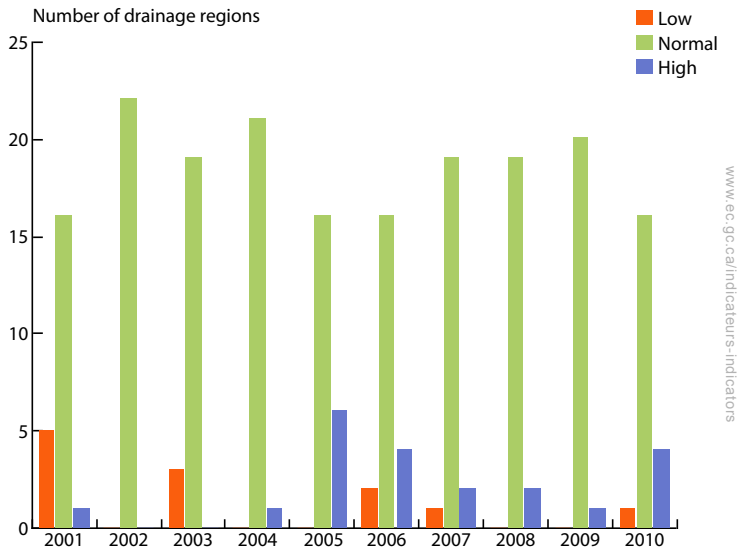
Progress Towards Goal 4: *Water quantity (water level indicator and water flow indicator)*

Between 2001 and 2010, Canada's rivers typically contained a normal quantity of water. However, as shown in Figure 3.15, there are variations from year to year. In 2010, 16 drainage regions had normal water quantity, 4 had higher-than-normal water quantity, and 1 region showed lower-than-normal water quantity. In 2001, 5 drainage regions experienced lower-than-normal water quantity — for example, central Canada had less than usual rainfall and snowfall that year. In 2005 — a particularly wet year in central Canada — higher-than-normal water quantity was observed in 6 drainage regions.

Natural changes in temperature, rainfall and snowfall can cause water quantities in rivers, lakes and reservoirs to rise and fall throughout the year. These weather fluctuations can result in flooding or water shortages.

For the most up-to-date information on this indicator, please visit CESI.

Figure 3.15: Water quantity in Canada's drainage regions, 2001 to 2010



Between 2001 and 2010, Canada's rivers typically contained a normal quantity of water.

In 2009, water in rivers was withdrawn for human use at a rate of greater than 40% (high threat to water availability) in portions of southern Ontario, southern Alberta, southern Saskatchewan, southwestern Manitoba and the Okanagan Valley of British Columbia; between 10% and 40% (moderate to medium threat) in portions of southern Alberta and southwestern Manitoba; and less than 10% (low threat) across the rest of Canada.

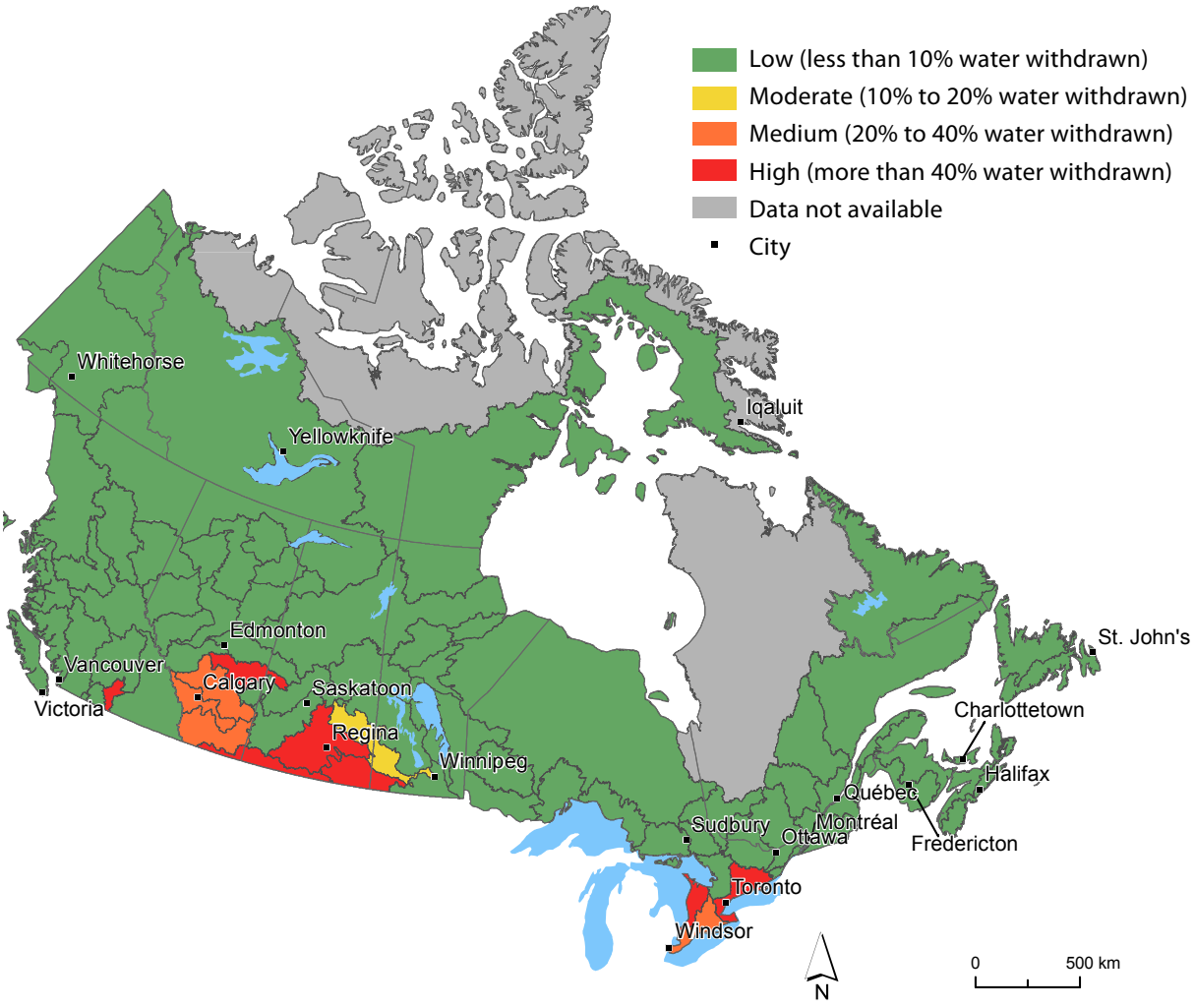
Progress Towards Goal 4: *Water availability*

In 2009, there was a high threat to water availability in portions of southern Ontario, southern Alberta, southern Saskatchewan, southwestern Manitoba and the Okanagan Valley of British Columbia. In these regions, more than 40% of water in rivers was withdrawn for human use. The threat was moderate to medium in portions of southern Alberta and southwestern Manitoba, where between 10% and 40% of river water was withdrawn for human use. The threat to water availability was low across the rest of Canada, as less than 10% of water in rivers in those areas was withdrawn for human use.

Together, urban growth, expanding industrial activity, increasing food production by farms and changing weather patterns are placing increasing pressure on Canada's freshwater supply.

Figure 3.16 displays the threats to water availability in Canada in 2009. For the most up-to-date information on this indicator, please visit CESI.

Figure 3.16: Threats to water availability in Canada, 2009



Using water wisely

Target 4.1: Water Resource Management and Use – *Promote the conservation and wise use of water to affect a 30 per cent reduction or increased efficiency in water use in various sectors by 2025 (based on 2009 water use levels).*

Together with the provinces, the government develops standards, tools, assessments, and mapping of aquifers and groundwater. The government conducts groundwater mapping and assessment activities on key aquifers to better understand the extent of groundwater systems, their dynamics and vulnerability. It also collaborates with its provincial partners to harmonize data and approaches in different jurisdictions. This information is disseminated through a collaborative, national inventory used by other levels and departments of government, planners and land-use professionals for decision-making. Between 2006 and 2009, the number of peer-reviewed scientific and technical papers produced increased by 8%. The government's comprehensive groundwater information resource and expertise contributes to sustainable land use and groundwater management. This, in turn, supports responsible development of Canada's natural resources.

The Water Survey of Canada is the national agency responsible for the collection, interpretation and dissemination of standardized water resource data and information in Canada. The agency has played a major role in the activities of numerous international and interprovincial boards and commissions involved in the management of Canada's water resources. Its water resource monitoring supports interjurisdictional agreements and treaties. Specifically, its services include the measurement, acquisition, processing, transformation and management of environmental data. The Water Survey of Canada provides real-time, current year and historical information for a network of over 2500 sites in Canada and maintains a database containing historic data for some 5500 non-active sites in the country.

Through the Western Diversification Program, the government invested $1 million in 2010 to support the development of new technologies to separate petroleum hydrocarbons and waste products from oil sands and water used in oil sands processing. The results could significantly reduce the quantity of energy and water needed to recover oil from oil sands, and to clean contaminated soils and water.

For additional information on the implementation strategies that support this target, please consult the following websites: Environment Canada, Natural Resources Canada, and Western Economic Diversification Canada.

In 2009, approximately 38 billion (38 000 million) cubic metres of water were withdrawn each year from Canada's lakes, rivers and groundwater sources by major sectors. Over 90% of this water was returned to its lake or river of origin.

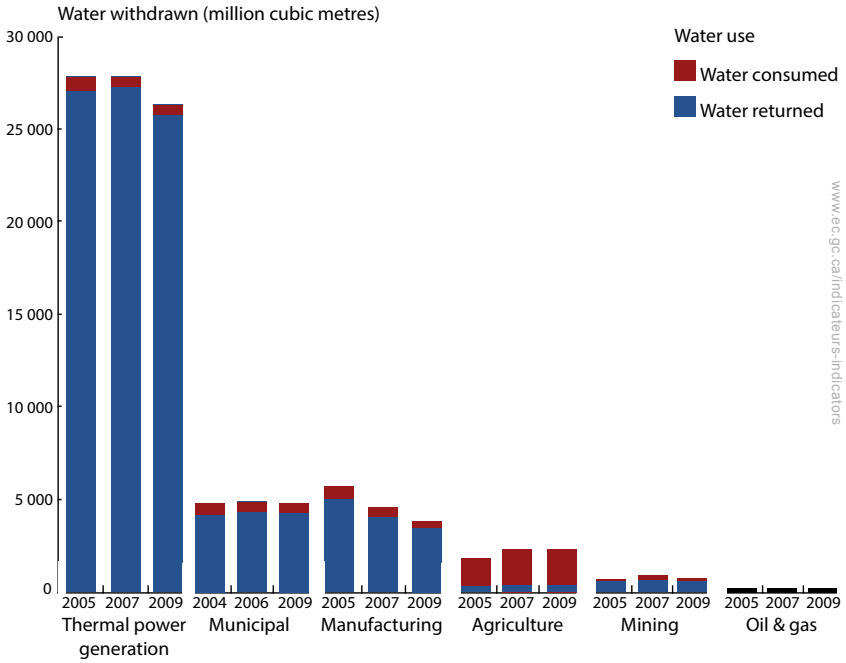
The major sectors include thermal power generation, municipal, manufacturing, agriculture, mining, and oil and gas.

Progress Towards Target 4.1: *Water use by major sectors from water use surveys*

In 2009, approximately 38 billion (38 000 million) cubic metres of water were withdrawn each year from Canada's lakes, rivers and groundwater sources by major sectors. Over 90% of this water was returned to its lake or river of origin. Of the water withdrawn, almost 3.4 billion cubic metres were consumed, or not returned to its lake or river of origin.

The major sectors withdrawing water include thermal power generation, municipal, manufacturing, agriculture, mining, and oil and gas. Figure 3.17 illustrates water withdrawal by sector between 2004 and 2009. Note: The proportions consumed and returned are not available for the oil and gas sector.

Figure 3.17: Water withdrawal by sector in Canada, 2004 to 2009



The thermal-power-generation industry (including nuclear and coal-fueled electricity generating stations) withdrew the most water of any sector between 2005 and 2009. Most is eventually discharged back to the source. The quantity of water not directly returned to the source is what is consumed by Canada's thermal power generation industry, which represents approximately 2% of the freshwater it takes from the environment.

The agricultural sector withdrew close to 2.0 billion cubic metres of water to irrigate crops and water livestock. In producing food for Canadians, the agriculture sector consumes approximately 84% of the water it withdraws. The agriculture sectors in British Columbia, Alberta and Saskatchewan are the largest consumers of water, since irrigation systems are used to compensate for naturally low water levels in these regions, and very little water used for irrigation is returned directly to its source. For the most up-to-date information on this indicator, please visit CESI.

The thermal-power-generation industry (including nuclear and coal-fueled electricity generating stations) withdrew the most water between 2005 and 2009. However, some of this water is reused and most is eventually discharged back to the source.

SECTION 4

PROTECTING NATURE

Most species were ranked as "secure" and few species have changed rank between 2005 and 2010.

In 2010, the *Wild Species* report assessed the general status ranks of 11 950 species.

Performance to Date

- In 2002, the Government of Canada introduced the *Species at Risk Act* to protect species at risk and their critical habitats. As of 2011, 616 species of animals and plants were recognized in at-risk categories (Endangered, Threatened or of Special Concern), which trigger government action to promote recovery.
- In 2011, following extensive consultations, the Polar Bear was listed as a species of special concern on the Species at Risk Public Registry.
- Conservation plans and strategies for 25 Bird Conservation Regions across Canada are currently being developed.
- The government continues to lead and cooperate with provinces and territories by providing expert advice on species at risk, migratory birds and their habitats for the Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring.

Remaining Challenges

- While 77% of the species assessed in 2010 were ranked "secure," 19% or more of three groups (reptiles, amphibians and freshwater mussels) were ranked as "at risk."
- On average, Canadian breeding bird populations declined by 12% between 1970 and 2012, with greater average declines in bird species that migrate further away from Canada.

Since 1990, the protected area in Canada has nearly doubled.

Almost 10% of Canada's land is now under protection.

Marine protected areas have doubled between 2002 and 2011.

Performance to Date

- As of 2011, approximately 8 million hectares of habitat for waterfowl had been secured in Canada through the North American Waterfowl Management Plan, with 70% of the increase occurring within the last 5 years.
- Canada designated its first *Oceans Act* Marine Protected Area in the Arctic (Tarium Niryutait), along with the world's first bowhead whale sanctuary, the Ninginganiq National Wildlife Area on Baffin Island in Nunavut.
- The National Framework for Canada's Network of Marine Protected Areas was released in 2011.
- In August 2012, the government announced the establishment of Náàts'ihch'oh National Park Reserve in Northwest Territories, protecting 70% of the upper South Nahanni watershed.
- In 2010, the *Canadian Biodiversity: Ecosystem Status and Trends* report summarized knowledge on ecosystems across Canada.

Remaining Challenges

- Less than 1% of Canada's ocean is formally protected—Canada has been ranked 70th out of 228 countries in terms of establishing marine protected areas.
- There is variability in the pattern of protected areas in Canada, as protected areas in southern Canada tend to be small and cover a smaller proportion of ecozones than protected areas in the North.
- The *Canadian Biodiversity: Ecosystem Status and Trends 2010* report notes at least some negative trends in all habitat types examined (i.e., forests, grasslands, wetlands, lakes and rivers, coastal, marine, and ice).

Wood supply has remained roughly constant since 1990.

From 1990 to 2010, the amount of timber harvested remained well within the supply of wood deemed sustainable for harvest.

In 2011, 72 of 155 (46%) major fish stocks assessed and reported were classified as "healthy," and 17 stocks (11%) were classified as critical.

In 2011, 137 of 155 major fish stocks were harvested at or below approved harvest limits.

Performance to Date

- Since 2009, the Sustainable Fisheries Framework has promoted a gradual improvement to the sustainable management of the fisheries. Significant progress has been made in implementing the Precautionary Approach Framework, such as developing baselines for various fish stocks.
- Since 2007, the Forest Communities Program has helped community-based partnerships adjust to the transition of the forest sector and take advantage of emerging forest-based opportunities at 11 sites across Canada.
- The annual State of Canada's Forest Report offers an objective assessment of Canada's forest resources and industry, and provides key facts and summaries of trends.

Remaining Challenges

- In 2011, 17 major Canadian fish stocks were classified as "critical," indicating that the productivity of the stock is considered to be at a level that may cause serious harm to the resource.
- The forestry sector is facing significant adaptation challenges in the face of economic and environmental changes.

Why It Matters

Nature provides the essentials of life: biological systems clean the air and water, and provide food. Natural ecosystems also underpin economic activity such as pulp, timber, fishing and recreational activities.

Canada's renewable natural resource industries comprise an important part of the Canadian economy. An estimated 80 000 Canadians make their living directly from fishing and related activities, and seafood is one of the largest commodity exports. Canada's forest industry employs about 236 000 people, largely in harvesting, milling, processing and manufacturing jobs. The Canadian agriculture, agri-food and agri-based products sector generates more than 2 million jobs and over 8% of GDP. Tourism is also important to the Canadian economy, with Parks Canada sites alone receiving more than 20 million person-visits annually, resulting in visitors spending $2.7 billion and supporting more than 41 000 jobs.

The government works with provinces and territories to monitor and conserve wildlife, habitat and ecosystems, and to manage Canada's biological resources. In 2011, the government announced its commitment to develop a National Conservation Plan through engagement with a broad range of stakeholders. This plan will work towards conserving Canada's natural spaces, connecting Canadians with nature, connecting habitats and ecosystems through stewardship efforts, and encouraging actions to restore degraded ecosystems and recover species at risk.

Wildlife and Ecosystem/Habitat Conservation and Protection

Canada contains large areas of intact ecosystems. Many are globally significant, notably: 30% of the world's boreal forests; 20 to 30% of freshwater wetlands and grasslands; vast Arctic, coastal and marine areas; and many lakes and rivers. These ecosystems support a diversity of life with more than 70 000 known species that perform critical roles, such as maintaining the healthy functioning of ecosystems on which humans and all other organisms depend for water and air purification, fertile soil, pollination, and many other benefits. Maintaining healthy populations of species is important, particularly in species that have experienced serious population declines as a result of pressures on their habitat. In some cases, this has resulted in species being protected under the *Species at Risk Act* (SARA). As of 2011, 616 species of animals and plants in Canada were classified as "Endangered," "Threatened," or of "Special Concern" under SARA.

In 2010, Canada supported the 2011–2020 United Nations Convention on Biological Diversity Strategic Plan, a globally aspirational, non-binding, flexible framework of goals and targets to halt the loss of biodiversity, and committed to developing domestic biodiversity targets adapted to the Canadian context.

Ecosystems and the species that are part of them face many pressures. Agricultural, urban and industrial developments have put pressure on Canada's ecosystems, leading to the loss, fragmentation and degradation of habitat, particularly grasslands, wetlands and southern forests in Canada. Human action is the leading cause of biodiversity loss around the world.

Other threats such as climate change, pollution and invasive alien species affect Canada's ecosystems and wildlife. Climate change leads to shifts in growing seasons and changes in the range of species, among other effects, which will lead to economic and ecological impacts. For example, partially as a result of milder winters and warmer summers that increase climatic suitability for infestation, the range of the mountain pine beetle is expanding in forests of western North America. The beetle outbreaks have cascading effects on other wildlife species and forest fire patterns. Invasive species act as predators, competitors, parasites, hybridizers, and diseases to Canada's native and domestic plants and animals.

Spills of hazardous substances into the environment from industrial or transportation-related accidents can cause immediate and often prolonged damage to the environment and human health. Every year there are around 20 000 spills of hazardous substances in Canada, although the vast majority are minor spills with a minimal impact on the environment. While larger spills occur much less frequently, they are very expensive to clean up and can have devastating effects on the environment, local economies and human health.

Protection of ecologically valuable areas and stewardship of working landscapes is key to preserving habitat and wild species. Protected areas[1] and other conservation measures can help protect terrestrial and marine environments from future degradation, protect resilience to stressors such as climate change, and/or restore lands and oceans to a more natural state.

Protection of ecologically valuable areas and stewardship of working landscapes is key to preserving habitat and wild species. Protected areas and other conservation measures can help protect terrestrial and marine environments from future degradation, protect resilience to stressors such as climate change, and/or restore lands and oceans to a more natural state.

Biological Resources

Sustainable management and harvest of Canada's forestry and fisheries resources protect species from overexploitation or poor management practices. Overexploitation of a resource can lead to economic and social hardship, such as the collapse of the Atlantic cod fishery in the early 1990s. Other industrial activities, such as mining, transportation, hydroelectric dams and oil/gas extraction, and climate change may also place pressure on Canada's economically valuable natural resources.

[1] A protected area is defined by the International Union for the Conservation of Nature as a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.

Conserving Wildlife

Goal 5: Wildlife Conservation – *Maintain or restore populations of wildlife to healthy levels.*

Progress Towards Goal 5: *Proportion of assessed species whose status is considered to be secure*

Canada supports a remarkable diversity of life. There are over 70 000 known species in Canada; there are still many species left to assess, with the vast majority of those species being insects and other invertebrates. Every five years, a *Wild Species* report by the Canadian Endangered Species Conservation Council compiles information on wild species, assessing the general status of species and species groups. This information can provide an early warning system of both potential signs of trouble or areas where progress is being made. This report also identifies gaps in Canada's knowledge of wild species.

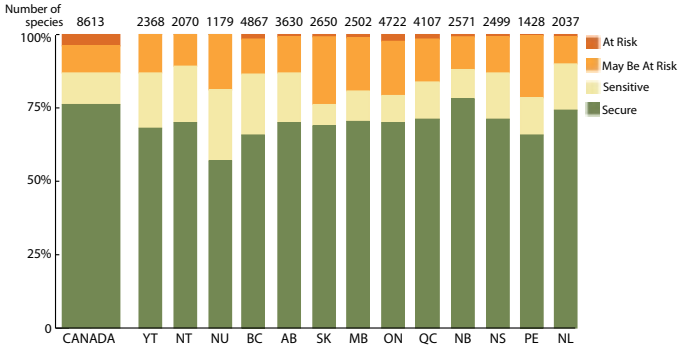
Between 2000 and 2010, the proportion of species ranked "secure" has varied between 70% and 77%, mostly due to the addition of new assessments of other taxonomic groups. Among Canada's wild species in 2010, 77% were ranked "secure," and 12% were ranked "at risk" or "may be at risk." These results are based on the assessment of 8 613 native Canadian species. The *Wild Species* 2010 report assessed the general status ranks of 11 950 species (including, for example, exotic species). Provincial breakdowns are provided in Figure 4.1.

Status varies by species group. Groups with the largest proportion of species ranked "secure" included anthropods (86%), birds (78%) and mosses (75%). The largest proportion of species ranked as either "at risk" or "may be at risk" included reptiles (43%), freshwater mussels (35%) and amphibians (20%).[2]

For the most up-to-date information on this indicator or more information on the general status by species group, please visit CESI.

Between 2000 and 2010, the proportion of species ranked "secure" has varied between 70% and 77%, mostly due to the addition of new assessments of other taxonomic groups. Among Canada's wild species assessed in 2010, 77% were ranked "secure," and 12% were ranked "at risk" or "may be at risk."

Figure 4.1: General status ranks of wild species in Canada, 2010



[2] These percentages compare the rankings to the total number of species in the four rankings of "at risk," "may be at risk," "sensitive" and "secure" and do not include those species that were rated extinct/extirpated, undermined or exotic.

Recovering species at risk

Target 5.1: Terrestrial and Aquatic Wildlife Conservation – *Population trend (when available) at the time of reassessment is consistent with the recovery strategy for all listed species at risk (for which recovery has been deemed feasible) by 2020.*

Of the 48 species deemed feasible to recover by Environment Canada, 21% (10) have population trends that are consistent with the goals laid out in the recovery strategies, 8% (4) do not, and 71% (34) need to be reassessed.

The government has taken action to protect and conserve Canada's rich and abundant biodiversity. The government continues to implement the *Species at Risk Act* (SARA), undertaking species assessments, consultations, listing and recovery planning.

In 2012, the government committed $50 million over the next two years to support continued efforts under SARA to protect wildlife species, maintain healthy ecosystems and preserve Canada's natural heritage. In addition, proposed or final recovery strategies addressing 190 species at risk were posted on the Species at Risk Public Registry, including 47 proposed or final recovery strategies. As of November 2012, 510 terrestrial and aquatic species of animals and plants are listed under SARA as Endangered, Threatened, of Special Concern or Extirpated.

Also in 2012, a final recovery strategy for Boreal Caribou was released that offers a strong, practical approach to conserving the species. The recovery strategy follows engagement with the public, Aboriginal communities, government, industry stakeholders, environmental non-governmental organizations and academia across Canada and more than 19 000 public comments were received and analyzed during the development of the recovery strategy.

In 2011, Polar Bears were listed under SARA as a species of Special Concern. As a result, a management plan must be prepared within three years. The management plan will build on the National Polar Bear Conservation Strategy, and its ultimate aim will be to alleviate human threats in order to remove the Polar Bear from the Species at Risk list.

The government continues its efforts to support the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). In the report *Wild Species* 2010: The General Status of Species in Canada, a total of 11 950 species were assessed from 20 different taxonomic groups.

The government continues to lead and cooperate with provinces and territories by providing expert advice on species at risk, migratory birds and their habitats for the Joint Canada-Alberta Implementation Plan for Oil Sands Monitoring, and high-profile environmental assessments, including the nuclear project in Darlington and the Lower Churchill hydroelectric development projects.

Overall, Canada's science programs provide research and monitoring, as well as advice, products, services and data management to help guide departmental and federal policies, programs, decisions and regulations for managing Canada's terrestrial, oceans, and, fish and wildlife habitat resources.

Internationally, Canada's work to fulfill its obligations under the Convention on International Trade in Endangered Species of Wild Fauna and Flora contributes to the conservation of species in Canada and abroad.

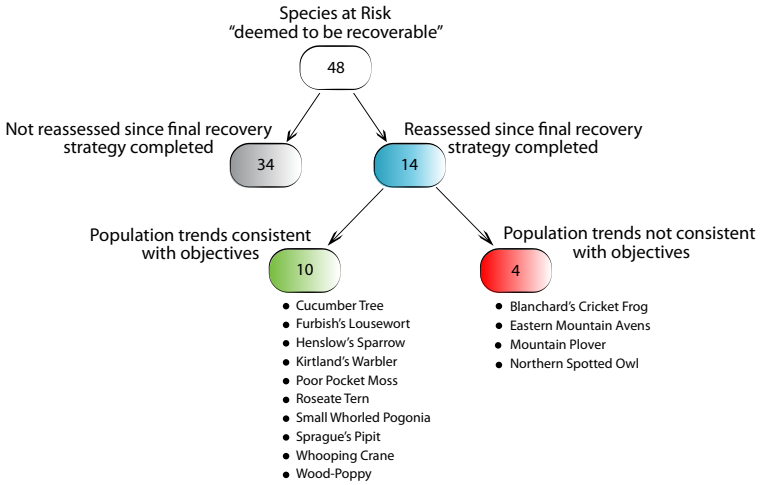
For additional information related to this target, please consult the following websites: Environment Canada, Fisheries and Oceans Canada, and Parks Canada.

Progress Towards Target 5.1: *Percentage of species at risk with Environment Canada recovery strategies where the population trend at the time of reassessment is consistent with the strategy (interim Indicator)*

Between 2006 and October 2011, Environment Canada developed final recovery strategies for 52 species, although it was determined that only 48 of these were feasible to recover. Of the 48 species deemed to be feasible to recover by Environment Canada, 21% (10) have population trends that are consistent with the goals laid out in the recovery strategies, 8% (4) do not and 71% (34) need to be reassessed, as illustrated by Figure 4.2. For more information on this indicator, please visit CESI.

In the same time period (2006 to 2011), Fisheries and Oceans Canada developed final recovery strategies for 51 species, of which 48 were deemed to be feasible for recovery, while the recovery of 3 extirpated species was deemed not feasible. Twenty-four of the 48 species have been reassessed by COSEWIC; 18 of these 24 species were maintained in the same status category, 2 improved in status (Sea Otter and Wavy-rayed Lampmussel), while 3 species saw their status deteriorate (Northern Abalone, Lake Chubsucker, Western Silvery Minnow). One species was no longer elegible for assessment (Aurora Trout).

Figure 4.2: Trends in population sizes of species at risk compared to recovery strategy objectives, Canada, 2011



Between August 2006 and December 2011, Parks Canada has completed final recovery strategies or management plans for 53 species at risk. Of those 53 species, 12 have been reassessed; nine have seen their COSEWIC status remain unchanged, one has been found to be in a higher risk category and two have been reassessed as lower risk, including the Swift Fox following successful reintroductions in Grasslands National Park and surrounding areas.

Maintaining healthy bird populations

Target 5.2: Terrestrial and Aquatic Wildlife Conservation

Target for proportion of migratory bird species whose population varies within acceptable bounds of the population goals will be established in 2011, once the Bird Status Database is complete.

In addition to SARA, the government administers other Acts of Parliament that support the conservation and protection of wildlife and their habitats. These include the *Canada Wildlife Act*, the *Migratory Birds Convention Act, 1994,* the *Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act*, and the *Canadian Environmental Protection Act, 1999.*

Conservation plans and strategies for 25 Bird Conservation Regions across Canada are currently being developed. In total, 11 conservation strategies have been drafted. These strategies outline habitat requirements, set population objectives, identify threats and recommend actions in support of migratory bird conservation in Canada and internationally. Recommended conservation actions include: law and policy development; land and water management or protection; research and monitoring; education and awareness building; external capacity building; and other species management actions.

For additional information on the implementation strategies that support this target, please consult the following website: Environment Canada.

On average, Canadian breeding bird populations declined by 12% between 1970 and 2010.

By 2010, bird species spending the entire year in Canada increased in population on average by 68% since 1970. Bird species migrating farther from home generally declined, and the birds migrating the farthest—to South America—showed the most severe declines, with populations declining by 53%. Birds migrating to the United States had 10% declines on average, while birds migrating to Central America declined by 14%.

Progress Towards Target 5.2: *Trends in canada's migratory bird populations (interim indicator)*

On average, Canadian breeding bird populations declined by 12% between 1970 and 2010.

By 2010, bird species spending the entire year in Canada increased in population on average by 68% since 1970, as shown by Table 4.1. Bird species migrating farther from home generally declined, and the birds migrating the farthest—to South America—showed the most severe declines, with populations declining by 53%. Birds migrating to the United States had 10% declines on average, while birds migrating to Central America declined by 14%.

For the most up-to-date information on this indicator, please visit CESI.

Table 4.1: Change in Canada's migratory bird population by primary wintering area, 1970–2010

Primary wintering areas	Percent changes from 1970 to 2010
Canada	+ 68 %
United States	– 10 %
Central America	– 14 %
South America	– 53 %
All species combined	**– 12 %**

Conserving Lands and Waters

Goal 6: Ecosystem/Habitat Conservation and Protection – *Maintain productive and resilient ecosystems with the capacity to recover and adapt; and protect areas in ways that leave them unimpaired for present and future generations.*

Progress Towards Goal 6: *Total protected area as proportion of national territory – includes land and marine area*

Since 1990, the overall protected area in Canada has nearly doubled, with close to 10% of land now under protection. This is an area close to the size of Ontario. As of 2011, 9.9% (991 482 km^2) of Canada's land area and about 0.70% (49 333 km^2) of its marine territory, including the extended continental shelf, have been protected. Marine protected areas have doubled between 2002 and 2011.

Based on internationally recognized definitions, protected areas are classified according to their management objective. As of 2011, 94% of protected lands in Canada were classified as "strictly protected." In the remaining 6%, limited use such as logging, fishing or very limited non-renewable resource extraction is permitted even though nature conservation remains the major goal.

Achievements over the last few years include the expansion of Nahanni National Park Reserve within the Dehcho region in 2009, increasing its size six-fold, and the establishment of Sable Island as a national park reserve in 2011. More recently, the government announced the establishment of Nááts'ihch'oh National Park Reserve in Northwest Territories, protecting 70% of the upper South Nahanni watershed.

Among the new protected areas under discussion is a national urban park in the Rouge Valley in Ontario. Progress is also being made towards establishing national parks in four unrepresented terrestrial natural regions, namely: East Coast Boreal (Mealy Mountains), Western High Arctic (Bathurst Island), Northwestern Boreal Uplands (Thaidene Nene in the East Arm of Great Slave Lake) and Manitoba Lowlands (Manitoba Lowlands).

Since 1990, the overall protected area in Canada has nearly doubled, with close to 10% of land now under protection. This is an area close to the size of Ontario.

The *Canadian Biodiversity: Ecosystem Status and Trends 2010* report listed 20 key findings on the health of Canada's ecosystems. Of these findings, some 22% were rated as "impaired," 50% were "of concern," 18% were "healthy," and 10% were undetermined.

Figure 4.3 demonstrates the increasing proportion of area protected in Canada between 1990 and 2011.

Compared with 10 industrialized countries using international data, Canada ranked fourth in total land area protected, behind the United States, Russia and Australia. In the establishment of marine protected areas, Canada was ranked 70 out of 228 countries. For the most up-to-date information on these indicators, please visit CESI.

Figure 4.4 indicates the protected areas in Canada, by type.

Figure 4.3: Trends in proportion of area protected in Canada, 1990–2011

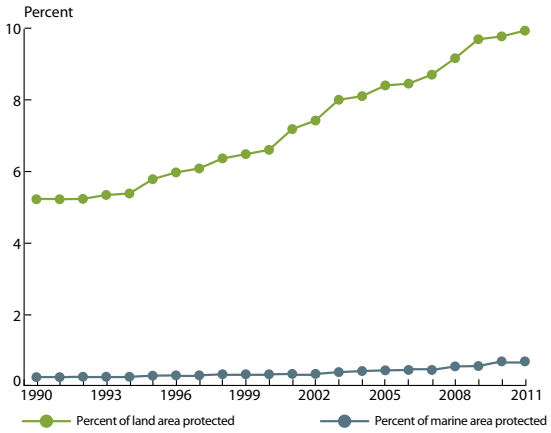


Figure 4.4: Protected areas in Canada, 2011

Progress Towards Goal 6: *Status of key findings related to the health of Canada's ecosystems*

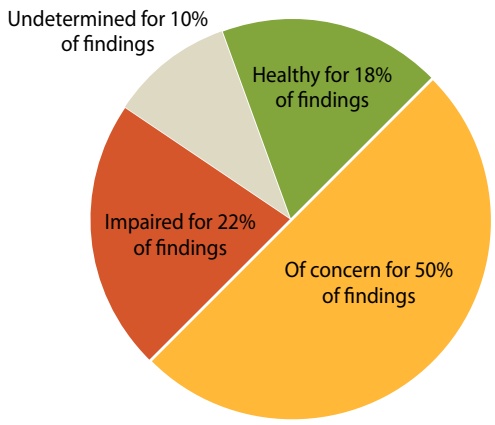
Canadian Biodiversity: Ecosystem Status and Trends 2010 reported the first ecosystem-level assessment of Canada's biodiversity and presented its results through key findings representing the most comprehensive compilation to date of the results of Canada's ecosystem-level biodiversity research and monitoring. Some findings reveal that much of Canada's natural endowment remains healthy, including large tracks of undisturbed wilderness, internationally significant wetlands and thriving estuaries, particularly in sparsely populated or less accessible areas. However, these key findings should not be interpreted as a direct and complete indicator of overall ecosystem health in Canada.

The *Canadian Biodiversity: Ecosystem Status and Trends 2010* report listed 20 key findings on the health of Canada's ecosystems. As shown in Figure 4.5, some 22% were rated as "impaired," 50% were "of concern," 18% were "healthy," and 10% were "undetermined."

Of the 20 key findings, 25% showed improvement or little change, with 58% getting worse, and 17% unknown.

For the most up-to-date information on this indicator, please visit CESI.

Figure 4.5: Status of key findings related to the health of Canada's ecosystems



www.ec.gc.ca/indicateurs-indicators

Conserving priority habitats

Target 6.1: Terrestrial Ecosystems and Habitat – *Non-park protected habitat: habitat target to support conservation of priority migratory birds and species at risk will be set by 2015.*

The government continues to work in collaboration with other jurisdictions to provide and protect habitat. Since 2007, the government has partnered with the Nature Conservancy of Canada, through the Natural Areas Conservation Program, to acquire privately held, ecologically sensitive lands through donation, purchase or stewardship agreements. These agreements supplement Canada's protected areas. In 2011, Canada and Nature Conservancy of Canada acquired more than 300 ha of land in New Brunswick and Nova Scotia to form a land bridge for terrestrial wildlife, including Mainland Moose and Canada Lynx, to move between habitats. As of December 2011, the Natural Areas Conservation Program has protected 327 757 ha of habitat.

In addition, in 2011, the Government of Canada and the Ontario Ministry of Natural Resources teamed up to protect habitat of the Piping Plover, a shorebird that is listed as endangered under SARA. In 2012, other partnership projects included protecting fragile habitats on Manitoulin Island and on the Acadian Peninsula in New Brunswick.

Internationally, Canada collaborated with the U.S. and Mexico to revise the North America Waterfowl Management Plan, which works to secure wetland and upland habitat for waterfowl birds. Canada also participated in the successful October 2010 Party to the Convention on Biological Diversity, where Canada and other countries agreed to a 10-year global Strategic Plan for Biodiversity. It includes a new global target for 2020 to conserve at least 17% of terrestrial areas and inland waters, and 10% of marine areas across the globe, through a combination of protected areas and other effective area-based conservation measures.

For additional information on the implementation strategies that support this target, please consult the following websites: Environment Canada and Finance Canada.

Progress Towards Target 6.1: *Habitat conserved through the North American Waterfowl Management Plan*

In Canada, 45 species of waterfowl rely on healthy wetlands for living and for raising their young. In the mid-1980s, North American waterfowl populations had plummeted to record lows, largely because of human activities that have resulted in the loss and/or degradation of wetlands. In response, the North American Waterfowl Management Plan (NAWMP) secures habitat for waterfowl, coordinated by the North American Wetlands Conservation Council (Canada).

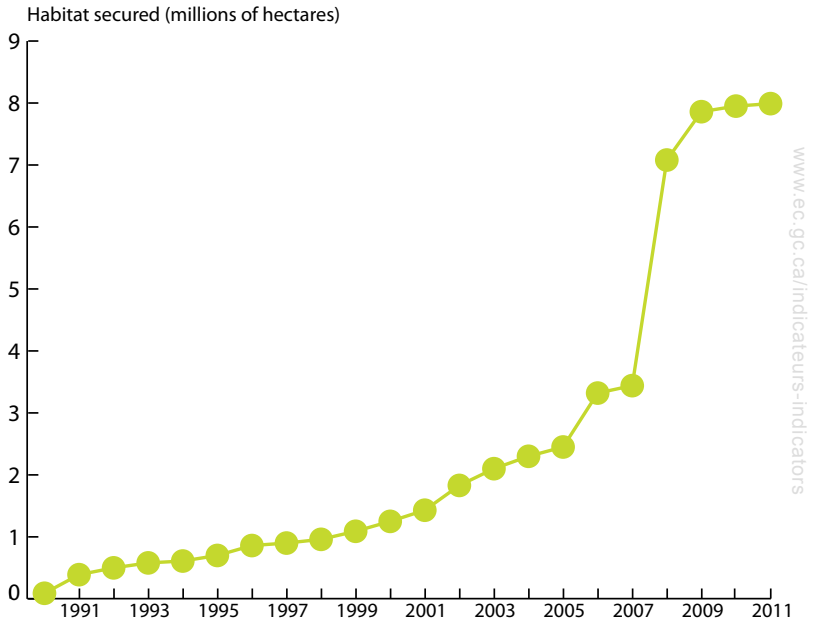
As of 2011, approximately 8 million hectares of habitat for waterfowl had been secured in Canada through the North American Waterfowl Management Plan. The area secured has been increasing since 1990, with 70% of the increase occurring in the last five years.

As of 2011–2012, 168 878 hectares of habitat had been secured in Canada through the Habitat Stewardship Program for species at risk, benefiting up to 417 species assessed as "at risk" by the Committee on the Status of Endangered Wildlife in Canada.

As of 2011, approximately 8 million ha of habitat for waterfowl had been secured in Canada through the NAWMP. As illustrated in Figure 4.6, the area secured has been increasing since 1990, with 70% of the increase occurring in the last five years. The large increase in 2008 is the result of the securing of habitat in the Western Boreal Forest region through Crown designation.

For the most up-to-date information on this indicator, please visit CESI.

Figure 4.6: Cumulative waterfowl habitat secured in Canada by North American Waterfowl Management Plan partners, 1990 to 2011

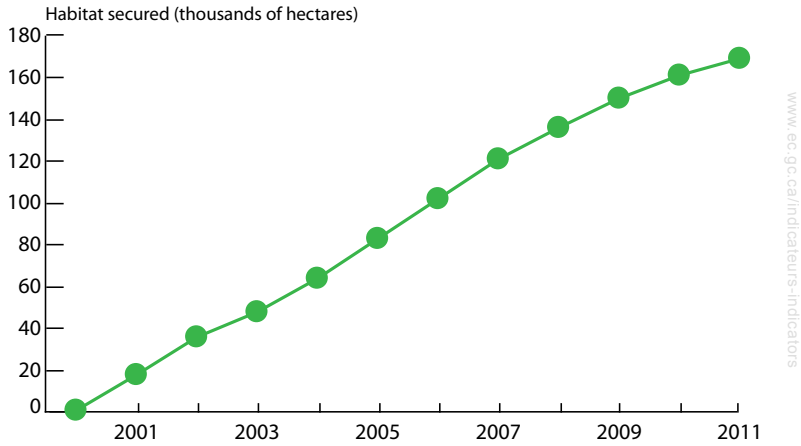


Progress Towards Target 6.1: *Habitat conserved through the Habitat Stewardship Program*

As of 2011–2012, 168 878 ha of habitat had been secured in Canada through the Habitat Stewardship Program (HSP) for Species at Risk, benefiting up to 417 species assessed as "at risk" by COSEWIC.

As indicated in Figure 4.7, the area secured has increased steadily since the program's inception in 2000. Canada launched the HSP in recognition of the importance of natural habitat to the survival and recovery of species. The HSP provides funding for stewardship activities that secure habitats for species assessed as nationally at risk (endangered, threatened or of special concern), and priority is given to projects that target species listed under SARA.

Figure 4.7: Cumulative species at risk habitat secured in Canada by Habitat Stewardship Program-funded projects, 2000 to 2011



As well, the HSP has established more than 200 partnerships with successful recipients and, overall, community involvement and partnerships are the strengths of this program. In 2011–2012, the HSP for Species at Risk allocated $11.5 million for 208 projects.

For the most up-to-date information on this indicator, please visit CESI.

Improving health of national parks

Target 6.2: Terrestrial Ecosystems and Habitat – *Park protected habitat: maintain or improve the overall ecological integrity in all national parks from March 2008 to 2013.*

Of the 102 ecosystems that Parks Canada has assessed, 92% (94) are reported to be in good or fair condition. Trends are more difficult to assess, but of the 81 ecosystems with reported trends, 46 (57%) are stable or improving.

As steward of Canada's national parks, Parks Canada has a legal obligation to maintain or improve ecological integrity while providing benefit and enjoyment for present and future generations of Canadians. Parks Canada regularly monitors the state of ecological integrity, and publishes the results for each national park every five years.

Each ecosystem is assessed for its ecological condition (good, fair or poor) and the trend in that condition (improving, stable or declining). Collectively, these assessments provide a basis for understanding the overall ecological integrity of a national park.

In 2011–2012, the Action on the Ground initiative entered its third year, addressing key ecological integrity issues in targeted national parks. Examples of actions are: enhancements to improve the ability of wildlife to move between watersheds in Gros Morne, Terra Nova and Kejimkujik National Parks; control of invasive species in Gwaii Haanas National Park Reserve and Haida Heritage Site and Gros Morne National Park; restoration of habitat for species at risk in Point Pelee National Park and Pacific Rim National Park Reserve; and, improvement to water quality in aquatic ecosystems in Riding Mountain National Park.

For additional information on the implementation strategies that support this target, please consult the following websites: Environment Canada, Natural Resources Canada and Parks Canada.

Progress Towards Target 6.2: *Percentage of national parks with maintained or improved overall ecological integrity*

The government is working to monitor the ecological integrity in 42 of Canada's national parks. As of 2011, 35 parks had reported on the ecological integrity of at least some of their ecosystems. Of the 102 ecosystems that Parks Canada has assessed, 92% (94) are reported to be in good or fair condition. Trends are more difficult to assess, but of the 81 ecosystems with reported trends, 46 (57%) are stable or improving, as shown in Figure 4.8.

Figure 4.9 shows ecological integrity status and trends by province or territory, national park and ecosystem. For the most up-to-date information on this indicator, please visit CESI.

Figure 4.8: Ecological integrity status and trends of national parks, Canada, 2011

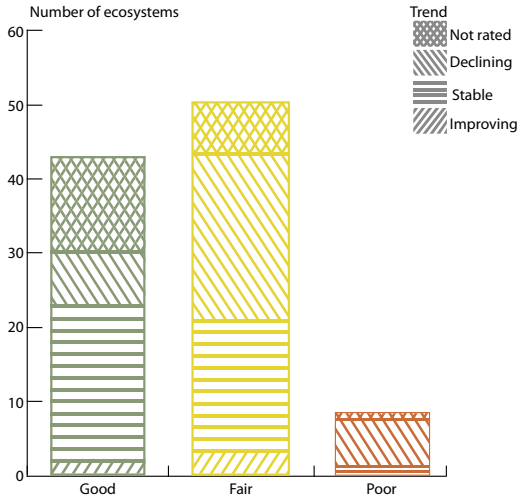
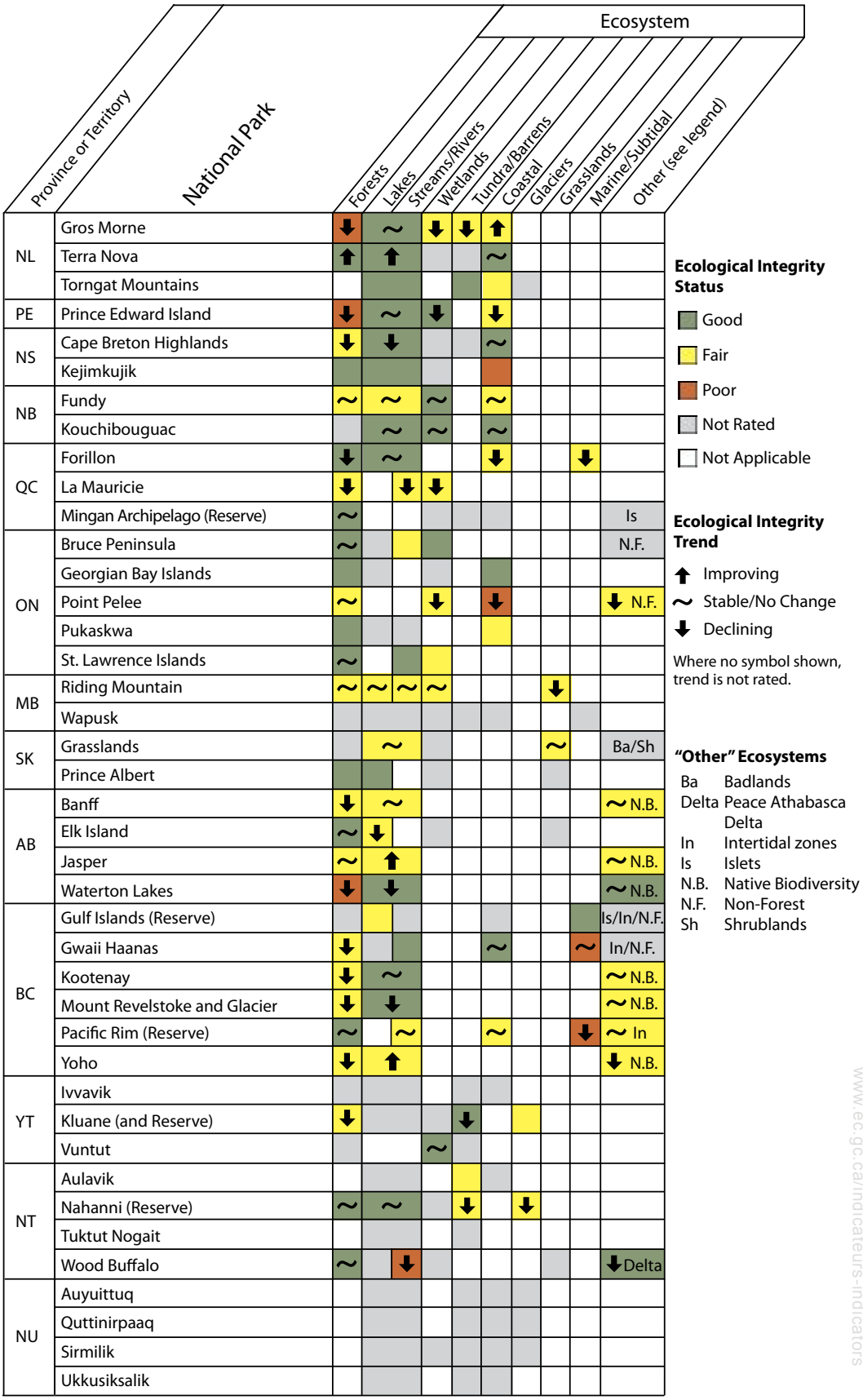


Figure 4.9: Ecological integrity status and trends of 42 national parks, Canada, 2011



Conserving marine ecosystems

Target 6.3: Marine Ecosystems – *Improve the conservation of ocean areas and marine ecosystems by 2012.*

The Parties to the Convention on Biological Diversity, which includes Canada, adopted the Strategic Plan for Biodiversity 2011–2020 in October 2010. The plan includes 20 global, aspirational targets, one of which includes the conservation of "at least…10 per cent of coastal and marine areas…through…ecologically representative and well connected systems of protected areas and other effective area-based conservation measures" by 2020.

The National Framework for Canada's Network of Marine Protected Areas (MPAs) was released in September 2011. It sets the overarching direction for the establishment of 13 nationally consistent bioregional networks of MPAs, in accordance with internationally accepted best practices. Bioregional MPA network planning is already underway in 5 bioregions.

The Government of Canada has a commitment under the *Oceans Act* to designate MPAs. To date, eight *Oceans Act* MPAs have been established, and there are seven active Areas of Interest across the country. Once designated, these MPAs will be included in Canada's national marine protected area network. Indicators and monitoring strategies used as the basis for management have been developed for 75% of the *Oceans Act* MPAs. In 2010, through collaboration between Fisheries and Oceans Canada, the Inuvialuit people, private industry, local stakeholders, and governments, Canada designated the Tarium Niryutait *Oceans Act* MPA. This is Canada's first MPA in the Arctic, where it protects the biological resources, including a population of beluga whales. This area is particularly important to the Beaufort Sea beluga whale stock.

The government has also established three new National Wildlife Area sites on Baffin Island, and one of these sites, the Ninginganiq (Isabella Bay), is the world's first-ever sanctuary for bowhead whales, assessed as threatened in Canada. Canada also proposed to establish the Scott Islands Marine National Wildlife Area on the Pacific Coast. The Scott Islands support the highest concentration of breeding seabirds in Canada's Pacific Ocean, and is one of the most ecologically vital locations in the Pacific Northwest Ocean ecosystem.

Canada has approximately 59 900 square kilometres (km^2) of federal, provincial and territorial protected areas covering about 1% of oceans (from the shoreline out to the limit of the Exclusive Economic Zone) and Great Lakes. Almost 49 100 km^2 of this protected area is marine and 10 800 km^2 is in the Great Lakes.

As assessed to date, contributory sites conserve an additional 0.7% (38 400 km^2) of Canada's oceans.

State of the Oceans Reports have been developed for each of the five large ocean management areas, as well as a national summary report.

Over the last few years, the government has added more than 13 500 km^2 to Parks Canada's system of national marine conservation areas. It is taking additional actions that will add up to 60 700 km^2 to the system, thereby increasing the total water area that comes under Parks Canada's stewardship by 74 200 km^2. In 2010, Gwaii Haanas National Marine Conservation Area Reserve and Haida Heritage Site was established, making it the first marine site to be legally protected under the *Canada National Marine Conservation Areas Act*. Progress is also being made towards establishing national marine conservation areas for Lancaster Sound in Nunavut, for the Southern Strait of Georgia in British Columbia and for a marine protected area in the waters around les Îles-de-la-Madeleine in Quebec.

Canada has adopted an integrated approach to the management of ocean-based activities. Five large ocean management areas (LOMAs) were established and form the planning basis for implementation of integrated management (IM) plans. These plans guide decision-makers in conservation, sustainable development, and use of coastal and marine resources. IM plans have been developed in three LOMAs, with the remaining two plans to be completed this year, and implementation will follow.

For additional information on the implementation strategies that support this target, please consult the following websites: Environment Canada, Fisheries and Oceans Canada, Natural Resources Canada and Parks Canada.

Progress Towards Target 6.3: *Percentage of marine area under a conservation regime*

Canada has approximately 59 900 km^2 of federal, provincial and territorial protected areas covering about 1% of oceans (from the shoreline out to the limit of the Exclusive Economic Zone) and the Great Lakes. Almost 49 100 km^2 of this protected area is marine and 10 800 km^2 is in the Great Lakes. As assessed to date, contributory sites shown in Figure 4.10 conserve an additional 0.7% (38 400 km^2) of Canada's oceans.

Canada is establishing a national network of MPAs, with the primary goal of protecting marine biodiversity, ecosystem function and special natural features. There are other conservation areas in the marine environment, known as "contributory sites," which contribute to achieving the objectives of the MPA network even though they do not meet the definition of an MPA. Contributory sites include, for example, some areas where critical habitat is protected under the provisions of SARA, and some areas where fishing activities are restricted under the *Fisheries Act*.

For the most up-to-date information on the indicator, please visit CESI.

Figure 4.10: Marine protected areas and contributory sites, Canada, 2012

Reducing alien species invasions

Target 6.4: Managing Threats to Ecosystems – *Threats of new alien invasive species entering Canada are understood and reduced by 2015.*

Canada has taken action to manage risks to ecosystems from invasive alien species. From 2005–2010, it committed $85 million to implement an Invasive Alien Species Strategy for Canada. This strategy emphasizes preventing the entry of new alien species by air, land and water, and responding quickly to prevent the establishment of those species that have arrived. The government addresses key pathways associated with trade and travel, and expands and refines programs related to risk assessment, regulatory development, border inspections, outreach and education.

Invasive species such as Asian carp have the potential to profoundly alter the Great Lakes and other freshwater ecosystems across Canada, as they compete with native fishes for food, space and spawning habitat. Possession of live Asian carp is prohibited in Ontario, and the governments of Canada and Ontario have significantly increased the number of border inspections of live fish destined for Ontario food markets.

In May 2012, the government announced new funding totalling $17.5 million over five years to protect Canada's Great Lakes from the threat of Asian carp. The funding will support education, development of an early warning and monitoring system with United States, and rapid response planning.

Recent amendments to the *Fisheries Act* provide explicit regulation-making authorities to address the threat of aquatic invasive species. The federal government is currently working with provinces and territories to develop a national aquatic invasive species regulatory proposal for prohibiting possession, transport and import of aquatic invasive species, and establishing authorities for control and eradication activities.

In the past, some invasive non-native species have entered Canadian waters through the exchange of ballast water from ships arriving in Canada from overseas locations. In 2004, the International Convention for the Control and Management of Ship's Ballast Water and Sediments was adopted. This convention, in conjunction with a binational inspection program between Canada and the U.S. established in 2006, helped to prevent ships from overseas locations that enter the Great Lakes from releasing any ballast water that may contain invasive non-native species into the waters of the Great Lakes. Since these programs have been in place, no new invasive non-native species attributable to ballast water from ships have been reported in the Great Lakes.

Since these programs have been in place, no new non-native species attributable to ship ballast have been reported in the Great Lakes.

For additional information on the implementation strategies that support this target, please consult the following websites: Agriculture and Agri-Food Canada, Canada Border Services Agency, Environment Canada, Fisheries and Oceans Canada, Natural Resources Canada and Transport Canada.

Progress Towards Target 6.4: *Invasive Species*

Options for an invasive alien species indicator(s) have been identified and are being assessed. Information for this indicator will be available on the CESI website at a later date.

Addressing environmental emergencies

Target 6.5: Managing Threats to Ecosystems – *Reduce the frequency and consequences of environmental emergencies that affect Canada.*

Since 2003, Canada has administered the *Environmental Emergencies Regulations* under the *Canadian Environmental Protection Act, 1999.* These regulations seek to reduce the frequency and consequences of uncontrolled, unplanned or accidental releases of hazardous substances into the environment. Under this Act, companies undertake proper environmental emergency planning to prevent, prepare for, respond to and recover from an environmental emergency. Amendments introduced in 2011 enhance the existing protection by adding 41 substances to the regulations that are flammable or otherwise hazardous, and strengthening the requirements of regulatees to inform the public of the measures that they will take and what the public should do in the event of an environmental emergency.

In 2011, Canada also implemented legislation and entered into agreements with some provinces and territories to improve Canada's overall level of emergency preparedness. The Environmental Emergencies Notification System maintains a 24-hour alerting system for the public and polluters to report spills to provincial and federal authorities. This enhances coordination between authorities and aids in oversight of the response.

For additional information on the implementation strategies that support this target, please consult the following websites: Environment Canada and Natural Resources Canada.

Progress Towards Target 6.5: *Environmental emergencies tracking*

Options for an indicator that tracks environmental emergencies are being assessed and will be reported at a later date.

Sustainably Using Biological Resources

Goal 7: Biological Resources – *Sustainable production and consumption of biological resources are within ecosystem limits.*

Progress Towards Goal 7: *Annual harvest of timber relative to the level of harvest deemed to be sustainable*

From 1990 until 2010, timber harvests in Canada were between 86% and 48% of the estimated supply of wood deemed sustainable for harvest.

Regulating the amount of wood that can be harvested is central to sustainable forest management strategies. Tracking harvest volumes allows forest managers to determine whether these levels comply with regulated amounts. "Wood supply" is the term used to describe the estimated volume of timber that can be harvested from an area while meeting criteria for sustainability. In Canada, various planning processes are used to estimate wood supply, depending on the forest land's ownership and regulatory environment.

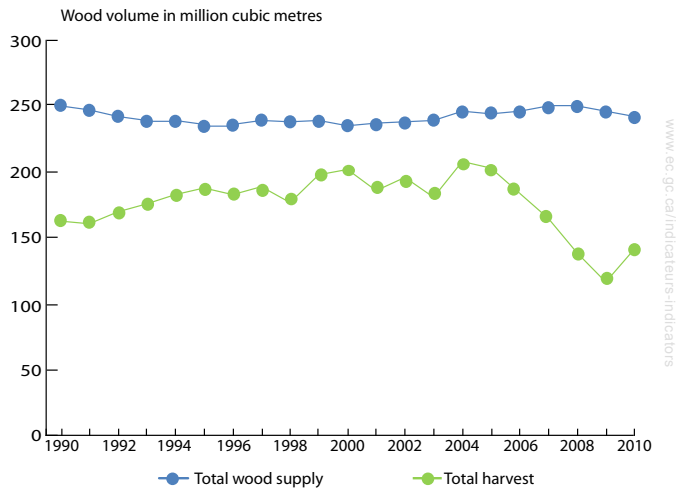
Canada's wood supply has remained relatively stable since 1990, at an average of 242 million cubic metres. In 2004, the total harvest volume reached a peak of 208 million cubic metres, and then declined to a low of 117 million cubic metres in 2009—the smallest harvest since 1990. The overall decline is the result of economic factors that have reduced the demand for Canadian lumber because of the slowdown in the U.S. housing market, and a reduced demand for Canadian pulp and paper products.

Sustainable forest management requires that the volume of wood harvested does not affect the long-term prospects of the forest as a resource. Figure 4.11 illustrates the reduction in wood harvests since 2005 relative to the level of harvest deemed to be sustainable. For the most up-to-date information on this indicator, please visit CESI.

From 1990 until 2010, timber harvests in Canada were between 86% and 48% of the estimated supply of wood deemed sustainable for harvest. Canada's wood supply has remained relatively stable since 1990 at an average of 242 million cubic metres.

Of 155 major fish stocks assessed and reported in 2011, 72 stocks (about 46%) were classified as "healthy." Seventeen stocks (11%) were classified as "critical," where the productivity of the stock is considered to be at a level that may cause serious harm to the resource.

Figure 4.11: Wood supply deemed sustainable for harvest and total harvest, Canada, 1990 to 2010



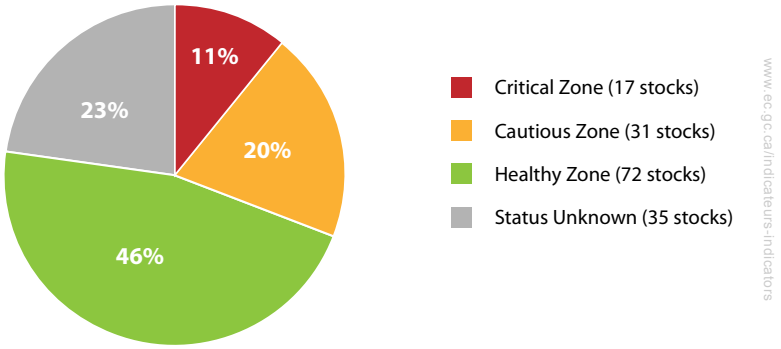
Progress Towards Goal 7: *Status of major fish stocks*

Of 155 major fish stocks assessed and reported in 2011, 72 stocks (46%) were classified as "healthy." Seventeen stocks (11%) were classified as "critical," where the productivity of the stock is considered to be at a level that may cause serious harm to the resource.

The status of fish stocks helps evaluate the impacts of past fishing and to manage present and future fishing pressures. The amount of fish that can be harvested is adjusted to keep stocks in the healthy status zone. A precautionary approach is applied to lower the permitted harvest where the stock is in the "cautious" zone, and to keep fishing to the lowest possible level if the stock is in the "critical" zone.

Figure 4.12 illustrates the status of major fish stocks in Canada in 2011. For the most up-to-date information on this indicator, please visit CESI.

Figure 4.12: Status of major fish stocks, Canada, 2011



Sustainable fish harvest

Target 7.1: Sustainable Fisheries – *Improve the management and conservation of major stocks.*

The goal of fisheries management is to conserve Canada's fisheries resources through close collaboration with resource users and stakeholders. As part of this objective, the federal government conducts scientific research on factors that affect marine ecosystems and migratory fish species. This information is shared widely through publications and presentations, through networks such as the Canadian Capture Fisheries Research Network, through Regional Fisheries Management Organizations, and through programs such as the International Fisheries Conservation Program and Conservation and Protection programs.

Since 2009, the Sustainable Fisheries Framework has provided a foundation for an ecosystem-based and precautionary approach to fisheries management in Canada to support conservation and sustainable use. It incorporates existing fisheries management policies with new and evolving ones. The framework also includes tools to monitor and assess initiatives, and identifies areas that may need improvement.

The framework's science-based policies and tools are applied through Integrated Fisheries Management Plans that identify goals related to conservation, management, enforcement and science for individual fisheries. They define access and allocations among various fish harvesters and fleet areas, incorporate biological and socio-economic considerations that are factored into harvest decisions, and include a requirement to conduct a regular review of the fishery against the plan's objectives. In addition, self-diagnostic tools like the Fishery Checklist (a tool for internal use) helps the government monitor improvements that support sustainable fisheries, and identify areas of weakness that require further work.

For additional information on the implementation strategies that support this target, please consult the following website:
Fisheries and Oceans Canada.

Of the 155 major stocks assessed in 2011, 137 (88%) were harvested at or below approved levels while 18 (12%) were harvested above approved levels. Stocks harvested above approved levels are recovered using quota reconciliation, where overharvest of a stock in one year is deducted from the harvest limit established for the following year.

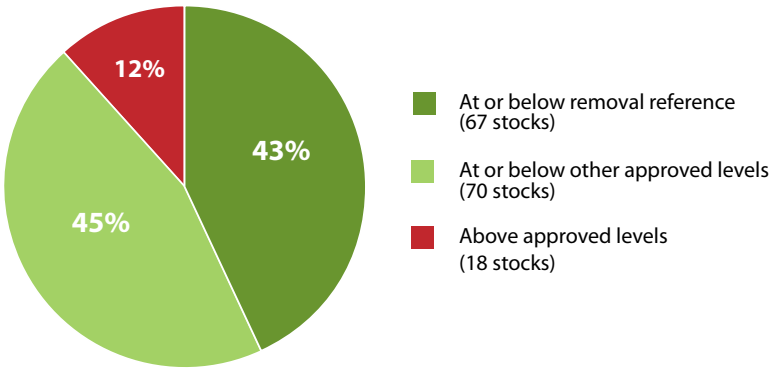
Progress Towards Target 7.1: *Percentage of major fish stocks where the harvest rate or level is at or below approved levels*

Of the 155 major stocks assessed in 2011, 137 (88%) were harvested at or below approved levels, while 18 (12%) were harvested above approved levels, as shown in Figure 4.13. Stocks harvested above approved levels are recovered using quota reconciliation, where overharvest of a stock in one year is deducted from the harvest limit established for the following year.

Canada establishes harvest limits for wild fish stocks to protect stocks for the future.

For the most up-to-date information on this indicator, please visit CESI.

Figure 4.13: Number of major fish stocks harvested relative to approved levels, Canada, 2011



Increasing sustainability of aquaculture

Target 7.2: Sustainable Aquaculture – *To promote the conservation and optimum use of marine resources and the aquatic environment through improved aquaculture management by 2014.*

The government provides science advice and proposes risk management options related to oceans. For example, the government has research programming to support regulatory work for aquaculture and ecosystem-based environmental decision-making.

In 2010, the new *Pacific Aquaculture Regulations* came into effect, governing activities such as licensing for fish cultivation in British Columbia. This licensing regime is consistent with the regime for other fisheries managed by the federal government, but is tailor-made to address the uniqueness of the aquaculture sector in this province.

For additional information on the implementation strategies that support this target, please consult the following website: Fisheries and Oceans Canada.

A complementary federal and provincial regulatory regime structure is being established to coordinate federal and provincial regulatory management measures, and to set appropriate standards of environmental protection.

Progress Towards Target 7.2: *Percentage of aquaculture managed under a science-base environmental regulatory framework*

The government is proposing the release of aquaculture substances regulations to authorize specified aquaculture activities under the *Fisheries Act*. At the same time, a complementary federal and provincial regulatory regime structure is being established to coordinate federal and provincial regulatory management measures, and to set appropriate standards of environmental protection. The new federal regulatory regime would ensure that regulatory measures are integrated across several pieces of federal and provincial legislation and regulation.

Information for this indicator will be available on the CESI website at a later date.

Progress Towards Target 7.2: *Percentage of Canadian aquaculture producers certified environmentally sustainable or positioned to implement certification*

Through the Aquaculture Sustainability Reporting Initiative, technical experts from the shellfish, marine finfish and freshwater fish sectors have identified certification as a key issue for sustainability reporting. They will provide advice on the development of this national certification indicator.

There are a number of existing provincial, Aboriginal and industry certification programs, and the government is currently developing a national indicator on aquaculture certification in Canada.

Information for this indicator will be available on the CESI website at a later date.

Understanding wise forest management

Target 7.3: Sustainable Forest Management – *Improve the management of Canada's forest ecosystems through the development and dissemination of knowledge.*

Advice to governments and stakeholders rooted in science helps the competitiveness of Canada's forest sectors and the responsible stewardship of Canada's forests.

Using this research to understand the impact of forest management activities enables the government and the provinces to develop sound policies to: support the sustainability of forests, the continuous production of desired goods and services; effectively represent domestic issues in international negotiations; and help improve environmental quality for Canadians. Understanding the impact of forest management activities also helps governments predict trends, causes and the rate of change in ecosystems, and identify ecosystems at risk as a result of climate change. Since 2007, the Forest Communities Program has helped community-based partnerships adjust to the transition of the forest sector and take advantage of emerging forest-based opportunities at 11 sites across Canada.

Scientific research helps to uphold national and international standards by recognizing Canadian work in sustainable forest management. Science is used to certify forestry practices that, in turn, open international markets to Canadian goods. The annual State of Canada's Forest Report offers an objective assessment of Canada's forest resources and industry, and provides key facts and summaries of trends.

From 1996 to 2011, the government supported First Nations in managing forestry resources through the First Nations Forestry Program. This program promotes partnership projects on sustainable forest management, knowledge and technology transfer, business opportunity facilitation, and support for specialized forestry technical training and work experience. The program has helped over 2400 forestry projects in First Nations communities across Canada. Over 200 publications about the results of these projects were developed in the course of the program, with 7 published in fiscal year 2010–2011.

For additional information on the implementation strategies that support this target, please consult the following websites: Aboriginal Affairs and Northern Development Canada, and Natural Resources Canada.

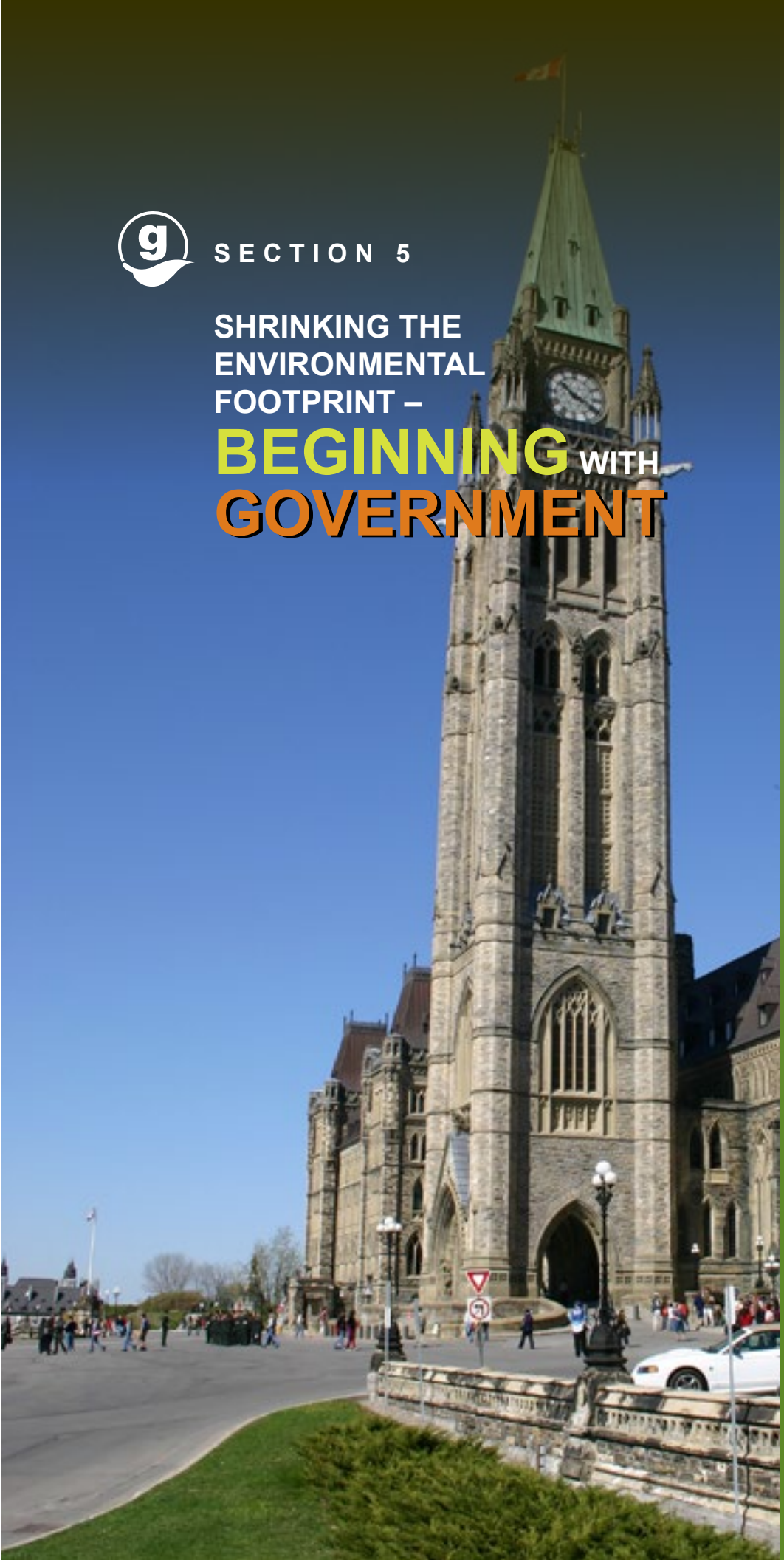
Natural Resources Canada produced 224 peer-reviewed publications related to forest ecosystems between fiscal years 2009–2010 and 2011–2012.

Research also enables the government to demonstrate that Canada's forest management is sustainable. This increases market access for Canada's forest products.

Progress Towards Target 7.3: *Number of peer-reviewed publications related to forest ecosystems*

Natural Resources Canada produced 224 peer-reviewed publications related to forest ecosystems between fiscal years 2009–2010 and 2011–2012.

Generating and disseminating scientific knowledge related to forest ecosystems is based on publications that have been peer reviewed to ensure that the analysis is scientifically sound. This focus on science further informs policy decisions.



SECTION 5

SHRINKING THE ENVIRONMENTAL FOOTPRINT – BEGINNING WITH GOVERNMENT

The Government of Canada has made significant strides in greening its operations.

All new government office buildings are required to meet the Canada Green Building Council's Leadership in Energy and Environmental Design Gold level.

Departments have committed to actions that will generate a 12% reduction in greenhouse gases by 2020–2021.

All departments have adopted green workplace practices including environmentally sound e-waste management, reduction of printing equipment and paper consumption, and integrating of environmental performance considerations into their procurement decisions.

Performance to Date

- The Government of Canada will conduct environmental performance assessments on 80% of fully occupied buildings greater than 1000 square metres. Initial project plans have been developed for 27 new construction, build-to-lease and major renovation projects to ensure that they meet a high level of environmental performance.
- A standardized accounting approach for greenhouse gases (GHGs) has been adopted across departments and annual reporting is now in place.
- Of the departments for which data was available, more than 3700 printing units and 175 tonnes of paper have been reduced.
- The Government of Canada now includes environmental considerations when renewing standing offers for commonly procured goods and services.

Remaining Challenges

- The findings from the environmental performance assessments for buildings will need to be addressed strategically to ensure these lead to GHG reductions, as additional initiatives will be required to reach the 17% GHG reduction target.
- Several departments do not have complete data for green workplace targets, and for many departments, assigning responsibility for implementation remains an ongoing challenge.
- Reaching and maintaining the green workplace targets over time will require continuing effort and oversight.

Why It Matters

Departments and agencies subject to the *Federal Sustainable Development Act* have a significant operational presence across Canada, with more than 28 000 buildings owned or leased, over 16 000 on-road vehicles, and more than 200 000 employees. In delivering services to Canadians, these departments generate a considerable environmental footprint as consumers of natural resources and producers of air emissions and waste products.

While federal environmental impacts represent a relatively small portion of Canada's overall footprint, Canadians expect their government to find more sustainable ways to deliver results and lead by example. As custodian, fleet manager, procurer of goods and services, and employer, the government has demonstrated a commitment to greening its operations. The Federal Sustainable Development Strategy (FSDS) includes targets in the areas of green buildings, GHG emissions, electronic waste, printing units, paper consumption, green meetings and green procurement. Public Works and Government Services Canada provides technical and policy support to departments in greening their operations.

Departments have laid the groundwork to reduce their environmental footprint, based upon 11 targets aimed at greening government operations. Departments subject to the *Federal Sustainable Development Act* have provided further information on their specific implementation strategies in their 2012–2013 Reports on Plans and Priorities, which was the basis for the information contained in this progress report. For more information on the applicability of greening government operation targets, please see Annex D.

For more information, please consult the Greening Government Operations supplementary tables to the 2012–2013 Reports Plans and Priorities:

- Aboriginal Affairs and Northern Development Canada
- Agriculture and Agri-Food Canada
- Atlantic Canada Opportunities Agency
- Canada Border Services Agency
- Canada Revenue Agency
- Canadian Heritage
- Canadian International Development Agency
- Citizenship and Immigration Canada
- Canada Economic Development for Quebec Regions
- Environment Canada
- Finance Canada
- Fisheries and Oceans Canada
- Foreign Affairs and International Trade Canada
- Health Canada
- Human Resources and Skills Development Canada
- Industry Canada
- Justice Canada
- National Defence
- Natural Resources Canada
- Parks Canada
- Public Health Agency of Canada
- Public Safety Canada
- Public Works and Government Services Canada
- Transport Canada
- Treasury Board of Canada Secretariat
- Veterans Affairs Canada
- Western Economic Diversification Canada

Improving the environmental performance of buildings

Goal 8: Greening Government Operations – *Minimize the environmental footprint of government operations.*

Target 8.1: *As of April 1, 2012, and pursuant to departmental strategic frameworks, new construction and build-to-lease projects and major renovation projects will achieve an industry-recognized level of high environmental performance.*

Target 8.2: *As of April 1, 2012, and pursuant to departmental strategic frameworks, existing Crown buildings over 1 000 m^2 will be assessed for environmental performance using an industry-recognized assessment tool.*

Target 8.3: *As of April 1, 2012, and pursuant to departmental strategic frameworks, new lease or lease renewal projects over 1 000 m^2, where the Crown is the major lessee, will be assessed for environmental performance using an industry-recognized assessment tool.*

Target 8.4: *As of April 1, 2012, and pursuant to departmental strategic frameworks, fit-up and refit projects will achieve an industry-recognized level of high environmental performance.*

Eighty percent (80%) of existing buildings will be assessed to identify environmental opportunities.

As one of the largest landlords in the country, the federal government is reducing the environmental footprint of its real property operations. Targets 8.1 to 8.4 of the FSDS underpin the government's efforts to manage federal real property more sustainably, including the improved management of energy, waste and water.

Twelve of 15 custodial departments have developed strategic frameworks to implement green construction and build-to-lease projects and major renovation projects, while 13 have also done the same for management of existing Crown-owned buildings, new lease or lease renewal projects, and for fit-up and refit projects. Of the 3 remaining departments, 1 will develop a Strategic Framework during fiscal year 2012–2013, 1 custodian is a lessee only and does not own any buildings, and the third intends to divest the only building in its portfolio located in Canada.

For 2012–2013, all 27 new construction and build-to-lease projects and major renovation projects will achieve a high level of environmental performance. Leadership in Energy and Environmental Design (LEED) Silver, Green Globe Design 3 Globes, and Building Owners and Managers Association (BOMA) were the most common (10 departments) minimum level of environmental performance departments are seeking to achieve. All newly constructed federal office buildings are required to meet the LEED Canada New Construction Gold level of environmental performance.

For 2012–2013, 27 new construction, build-to-lease and major renovation projects are aiming to meet high environmental performance levels.

In 13 departments, 1908 existing Crown-owned buildings have been identified for environmental performance assessment, accounting for 80% of fully occupied buildings greater than 1000 m^2. Most departments have chosen the BOMA Building Environment Standards (BOMA BESt) tool to assess the environmental performance of their Crown-owned buildings. Similarly, 13 departments have chosen to use the BOMA BESt tool to assess the environmental performance of federal building leases, with 50 new lease or lease renewal projects identified for assessment. Although the target is aimed at buildings over 1000 m^2, some smaller buildings were also included for BOMA BESt assessment.

Twenty-two fit-up and refit projects are planned by 12 departments, with Public Works and Government Services Canada planning the majority of these projects (15 projects). Over 90% of these projects are aiming to achieve either 3 Green Globes or LEED Silver as the minimum level of environmental performance.

Reducing greenhouse gas emissions from government operations

Target 8.5: *The Government of Canada will take action now to reduce levels of greenhouse gas emissions from its operations, to match the national target of 17% below 2005 by 2020.*

Plans are in place to achieve reductions in GHG emissions of 3% below base year levels by 2012–2013.

Standardized tracking and reporting is now done annually across departments.

The 15 departments subject to this target are required to reduce GHG emissions from their buildings and fleets. They account for over 95% of GHG emissions from buildings and fleets owned by *Federal Sustainable Development Act* departments.

To reduce GHG emissions, a key first step is to properly measure emissions and establish a base-year inventory. All departments subject to the GHG emission reduction target have quantified their base-year emission levels for fiscal year 2005–2006, in accordance with the *Federal Greenhouse Gas Tracking Protocol – A Common Standard for Federal Operations*. The aggregate of the 15 departments' GHG emissions in the base year was 1322 kilotonnes, in units of carbon dioxide equivalent (CO_2e).

By the end of fiscal 2011–2012, 13 departments (87%) had put in place a GHG emission reduction implementation plan. Various GHG reduction strategies, such as energy efficiency upgrades and retrofits, renewable power purchases, and fleet rationalization and renewal, are currently underway.

Beginning fiscal year 2011–2012, all 15 departments are measuring their progress and reporting their GHG emissions on an annual basis. These data are published as part of annual Departmental Performance Reports.

In the short term, planned reductions reported by the 15 departments would cut government-wide GHG emission levels to 3% below base-year levels by the end of fiscal year 2012–2013. As currently planned in the departmental Reports on Plans and Priorities (2012–2013), the government is on track to achieve a 12% decrease in emission levels relative to the base year by fiscal year 2020–2021. A projected gap of about 5% highlights the need for additional efforts in order to achieve the 17% federal target. It should be noted that the projected decrease is subject to change over time as departments analyze their data, refine their strategies and adopt new technologies.

Natural Resources Canada's Greenhouse Gas Reduction Efforts

To meet its 17% GHG reduction target, Natural Resources Canada (NRCan) has planned activities under its Low Carbon Initiative. These include major energy retrofits at select NRCan facilities, greening Information Technology projects, workspace consolidation, recommissioning and continuous building optimization.

NRCan incorporates energy efficiency into its governance practices, increases employee engagement and provides energy awareness training.

Under the Accelerated Infrastructure Program, projects in 2009–2010 and 2010–2011 included various energy-saving upgrades and replacements, such as energy-efficient lighting, building envelope sealing, and new chillers and boilers.

Managing electronic waste

Target 8.6: *By March 31, 2014, each department will reuse or recycle all surplus electronic and electrical equipment (EEE) in an environmentally sound and secure manner.*

Ninety-six percent (96%) of departments have plans in place to dispose of e-waste in an environmentally sound manner.

Every year, the federal government purchases large quantities of electronic and electrical equipment (EEE), including computer, laboratory, medical, security, telecomm, audio-visual and office equipment. Technological advances result in rapid obsolescence of equipment and drive the need to replace EEE. Federal departments and agencies must adopt environmentally sound and secure disposal practices for obsolete equipment.

Twenty-six federal departments (96%) have developed a plan for EEE disposal in accordance with the Guideline for the Environmentally Sound Disposal of Electronic and Electrical Equipment. These plans define roles and responsibilities with respect to disposal within the department, develop processes to track and report on EEE, and outline a departmental engagement strategy and the mechanisms to evaluate the plan's effectiveness. A standing offer has been put in place to facilitate the environmentally sound recycling of federal departments' EEE that is not eligible for reuse or recycling through provincial programs.

Reducing printing units

Target 8.7: *By March 31, 2013, each department will achieve an 8:1 average ratio of office employees to printing units. Departments will apply the target where building occupancy levels, security considerations and space configuration allow.*

Within the 19 departments for which data was available, at least 3700 printing units have already been reduced.

The government has a large and varied inventory of local printers and other single-function devices such as scanners, fax machines, network printers and photocopiers. The Printing Unit Reduction Target (Target 8.7) provides a multi-year approach to phase in printing unit reduction and migrate towards multi-function devices. The target will help shrink the environmental footprint of government operations through electronic waste management. Plug load reduction will help decrease GHG emissions.

Among the 27 departments, a total of 22 (81%) have already put plans in place to increase the ratio of employee-to-printing-unit to 8:1, ahead of the required timeline. Within the 19 departments for which data was available, at least 3700 printing units have already been reduced.

Reducing paper consumption

Target 8.8: *By March 31, 2014, each department will reduce internal paper consumption per office employee by 20%. Each department will establish a baseline between 2005–2006 and 2011–2012, and applicable scope.*

The federal government is a significant purchaser and consumer of paper. Almost 7000 t of paper are used to feed government photocopiers, printers and fax machines annually, costing nearly $10 million.

All 27 FSDS departments are subject to this target. As groundwork, 23 (85%) of departments have established a baseline year and reported on their paper-consumption-per-office-employee for that year. A total of 4 departments (15%) reported that they can meet, have already exceeded, or will exceed the 20% reduction target in fiscal year 2012–2013, a year ahead of the established deadline. Within the 20 departments for which data was available, at least 175 t of paper have already been reduced.

Within the 20 departments for which data was available, at least 175 tonnes of paper have already been reduced.

Greening meetings

Target 8.9: *By March 31, 2012, each department will adopt a guide for greening meetings.*

Meetings and events can generate large amounts of waste, consume significant quantities of energy, paper, water and other resources, and contribute to GHG emissions. Taking action to green meetings can engage employees in improving federal government office practices.

Among the 27 departments subject to this target, 25 (93%) have a departmental green meeting guide in place. One of the remaining departments has a draft guide developed; the other will develop its departmental guide within the 2012–2013 fiscal year. As of March 31, 2012, 20 (74%) departments had formally adopted their guide as part of their departmental processes, and 4 departments (15%) reported that they aim to track and report on their meeting guide usage.

Ninety-three percent (93%) of departments have a green meeting guide in place.

Greening procurement

Target 8.10: *As of April 1, 2011, each department will establish at least three SMART green procurement targets to reduce environmental impacts.*

Target 8.11: *As of April 1, 2011, each department will establish SMART targets for training, employee performance evaluations, and management processes and controls, as they pertain to procurement decision-making.*

Departments are targeting greener procurement of key goods and services, including information technology hardware, paper and vehicles.

The government is a significant purchaser of goods and services, spending billions of dollars annually. Since 2006, the Policy on Green Procurement has required environmental performance considerations to be integrated into federal procurement decision-making processes for all departments, as defined by Section 2 of the *Financial Administration Act*. This includes all 27 FSDA departments. Targets 8.10 and 8.11 contribute to the overall goal of shrinking the environmental footprint of government operations by requiring specific actions on the part of departments to integrate environmental considerations into their procurement processes.

To meet the requirements of Target 8.10, 20 departments have focused on purchasing environmentally preferable information technology hardware; 14 have highlighted paper procurement; and 13 have directed attention towards vehicle procurement.

Under Target 8.11, departments incorporate environmental performance considerations into procurement decision-making. As part of this target, departments develop implementation strategies related to:

- Green procurement training for select employees;
- Inclusion of environmental performance clauses into the performance evaluations; and
- Integration of environmental considerations into management processes and controls.

Department of National Defence Greens Its Aircraft Hydraulic Fluids

The Department of National Defence operates many aircraft fleets that utilize hydraulic fluids to function a variety of aircraft systems such as variable pitch propellers, landing gear, brakes, rescue hoists, cargo doors and flight control systems. As part of its commitment to green procurement, the Department is planning to switch to an environmentally preferable hydraulic fluid for 13 of its aircraft fleets by March 31, 2014. The Department is planning to explore a means to extend this initiative to the remaining fleets that are owned, operated and/or maintained under various service contracts.

Procurement personnel (26 departments), materiel managers (19 departments) and acquisition cardholders (13 departments) are the major target groups for training. Twenty-three departments use existing government green procurement training courses as their source of training, while others tailor in-house training. Eight departments have already achieved 100% training of their targeted personnel, while 13 others have trained over 50% of their key procurement staff. Departments have targeted key management processes and controls in which to integrate environmental considerations, including various policies, guidelines, standards, training, financial systems, procurement strategies, and the procurement planning, procurement management and business planning processes.

Eight departments have already achieved 100% training of their targeted personnel, while 13 others have trained over 50% of their key procurement staff.

SECTION 6

TRANSPARENCY AND ACCOUNTABILITY

Progress towards greater transparency: Plan, Do, Check and Improve

The first three-year cycle (2010–2013) of the Federal Sustainable Development Strategy (FSDS) is grounded in the commitment to use each Progress Report to identify opportunities for improving subsequent FSDSs with the aim of making environmental decision-making more transparent and accountable to Parliament. A great deal has already been accomplished to improve transparency by providing:

1. An integrated, whole-of-government picture of actions and results to achieve environmental sustainability;
2. A link between sustainable development planning and reporting and the government's core expenditure planning and reporting system; and,
3. Effective measurement, monitoring and reporting in order to track and report on progress to Canadians.

In addition, the FSDS supports links to economic and social policy through strengthened strategic environmental assessments that apply the FSDS goals and targets.

The three-year cycle of transparency establishes a system of "plan, do, check, improve" that, over time, will drive change. Progress towards targets is being tracked and gaps have emerged. Successive strategies will review those gaps and reflect policy changes driven by improved transparency.

The first cycle of the Federal Sustainable Development Strategy provided government decision-makers and managers with a suite of tools to coordinate action across the federal government and track progress. These tools are making environmental decision-making more transparent and accountable to Parliament, as required by the *Federal Sustainable Development Act*.

Whole-of-Government View

The FSDS presents a whole-of-government view of environmental priorities at the federal level, with the goals, targets and implementation strategies across 27 departments and agencies. This whole-of-government view has helped bring coherence both to Canada's domestic policy and its engagement with international partners on sustainable development. For example:

- The FSDS contributed to Canada's preparations for the 2011 United Nations Commission on Sustainable Development (CSD 19). Notably, it identified the collection of commitments and implementation strategies that represented Canada's efforts for the Commission's key themes, such as Sustainable Consumption and Production.
- The FSDS was used to inform and strengthen Canada's review of progress on the Organisation for Economic Co-operation and Development (OECD) 2004 Environmental Performance Review

of Canada.

- The FSDS is being used to inform Canada's position in bilateral and multilateral agreements on environmental quality and trade, including negotiations with the European Union to establish a comprehensive economic and trade agreement.
- The FSDS was included in the toolkit of best practices identified by the G8 and G20 leaders during their development of a Green Economy strategy in 2012.
- The Australian government uses our FSDS as an international example of how to integrate sustainability considerations into government operations and strategic planning.
- The role of the FSDS was profiled at the United Nations Rio+20 Conference in Canada's National Submission as the federal framework for sustainable development.

The FSDS is also being used by departments and agencies as background information and to provide policy context for sustainable development.

- The Department of Fisheries and Oceans views the FSDS as an element of accountability on sustainable development for industry and government, and as a driver of its precautionary and ecosystem approach to natural resource management.
- The FSDS provides policy context to Western Economic Diversification Canada's corporate business planning exercises.

While the FSDS tabled in 2010 provided a snapshot of the whole-of-government view of environmental sustainability priorities, since that time, the government has renewed some programs, completed others, developed or updated regulations and initiated new commitments. In some cases, this has resulted in the programs and activities in the first FSDS not reflecting the priority now given to these initiatives. Examples include the government's commitment to strengthening its role as a world-class regulator, putting in place a comprehensive environmental monitoring program in the oil sands, and supporting Canadians in adapting to a changing climate.

In addition, the first cycle of the FSDS included the departments and agencies designated by the *Federal Sustainable Development Act*, and some contributions by other departments and agencies towards federal efforts to achieve FSDS goals and targets. Subsequent cycles of the FSDS will continue to reflect this whole-of-government view of environmental sustainability priorities, and broaden its scope of participation by welcoming non-FSDA departments to participate voluntarily, where appropriate.

Linking to the government's core expenditure management system

Much of the success to date in bringing sustainable development issues into the government's overall decision-making comes as a result of incorporating the FSDS into the government's Expenditure Management System (EMS). This integration began in 2011, when annual Reports on Plans and Priorities (RPPs) and the websites of each federal department and agency were required to incorporate elements of the FSDS. Taken together, these are considered to be Departmental Sustainable Development Strategies (DSDSs).

The integration of sustainable development practices into departmental RPPs occurs at many levels, including:

- An overview of departmental contributions in support of the FSDS;
- Visual identifiers and descriptions of key FSDS contributions, such as implementation strategies; and
- Hyperlinks to the Greening Government Operations (GGO) supplementary tables and DSDS websites.

The departmental website component of the DSDS, reported annually, provides detailed descriptions of the departmental contributions towards the FSDS. In particular, the website highlights a department's sustainable development vision, describes departmental decision-making and sustainable development practices, provides more details regarding the implementation strategies identified in the first three themes of the FSDS (and briefly described in the RPP), and describes additional departmental sustainable development activities/initiatives that were not captured in the FSDS. Departments' and agencies' GGO targets, performance measures and implementation strategies are captured in RPPs and Departmental Performance Reports (DPRs) in the GGO Supplementary Table.

FSDS performance reporting is also incorporated into the EMS through the DPR and performance reports on departmental websites.

Integration of the FSDS throughout a department's activities is an ongoing process. Aligning FSDS goals, targets and implementation strategies with the departmental Program Alignment Architectures (PAAs), required under the Treasury Board Policy on Measurement, Resources and Results Structures, represents a critical step forward. The "plan, do, check, improve" approach of the FSDS will lead to minor structural changes to FSDS departments' PAAs over several cycles of the FSDS. Targets and implementation strategies will be added and moved, for example, to facilitate effective alignment with departmental PAAs.

A valuable outcome of integrating the Federal Sustainable Development Strategy into the Expenditure Management System is the opportunity to use existing departmental commitments and performance measures to inform the horizontal, whole-of-government approach of the Federal Sustainable Development Strategy.

Departments and agencies have reached various stages in aligning the FSDS with their departmental planning and performance information, and this process will continue over time as departmental commitments evolve to support government priorities. This deeper integration will also provide the basis for eventually identifying appropriate financial information to round out the measures of performance and progress towards FSDS goals and targets, and support more efficient and coherent reporting by the federal government.

Measuring, Monitoring and Reporting on Progress

As part of its broader commitment to transparency in environmental decision-making, the government has made the Canadian Environmental Sustainability Indicators (CESI) program a permanent feature of its environmental reporting. CESI has significantly expanded its suite of indicators to measure progress towards the goals and targets of the FSDS, and these indicators are found throughout this report. Indicators tracking the progress of the FSDS are prepared by Environment Canada with the support of other federal government departments, such as Health Canada, Statistics Canada, Natural Resources Canada, Agriculture and Agri-Food Canada, Fisheries and Oceans Canada, Aboriginal Affairs and Northern Development Canada, as well as data from provincial and territorial government departments. Designed to be relevant to government policy, the indicators are built on rigorous methodology and high-quality, regularly available data from surveys and monitoring networks.

Another commitment to transparency in environmental decision-making relates to the attributes of the targets. The FSDS is committed to using the SMART (Specific, Measurable, Achievable, Relevant and Time-bound) criteria when developing and refining targets. As FSDS targets become SMART or move towards SMART, they enable more effective reporting on progress towards environmental outcomes, particularly when the targets and indicators provide greater specificity, such as measuring components by how much and by when. Work will continue in future cycles of the FSDS to bring greater focus on environmental outcomes.

When measuring, monitoring and reporting on progress, it is also important to note that the 2010 FSDS sets out goals and targets that the federal government supports within the constraints of its jurisdiction and authorities. In many cases, the impacts take time to realize. Outcomes often depend on the contributions of many others, such as foreign, provincial, territorial and municipal governments, businesses, and individuals. In other cases, the federal government contributes by providing scientific expertise and knowledge, but, in some cases, other jurisdictions implement specific program measures. It often enacts environmental regulations, but the concrete results will only be known

once the implementation of the regulations is well underway. As a result, it is often difficult to make direct links between federal government actions and how those actions affect particular environmental outcomes.

The performance information provided to describe how the federal government is meeting its commitments can be improved. Financial information about federal investments in programming, for example, can help a reader better understand the extent of commitments made. But to deliver this information on a systematic basis over time requires changes to how initiatives are presented and tracked. This report takes a step towards this practice by including financial information on the Clean Air Agenda programming in the Annex to this report.

Work will continue in future cycles of the FSDS, to adjust and align DSDSs with departmental PAAs, to deliver this level of information accurately on an ongoing basis.

Integrating sustainability into decision-making

Strategic Environmental Assessments

In the 2010 FSDS, the government committed to strengthening the inclusion of environmental considerations in its own decision-making. This commitment makes use of Strategic Environmental Assessments (SEAs) that integrate environmental considerations into the government's decision-making, as described in the Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals. In October 2010, revised Guidelines for Implementing the Cabinet Directive (the Guidelines) were published to coincide with the release of the FSDS. There are three important changes to the Guidelines:

- Applying FSDS goals and targets when undertaking SEAs;
- Reporting on the results of SEAs in DPRs; and,
- Describing positive or negative contributions of the proposals to the achievement of the FSDS goals and targets in SEA public statements.

The Guidelines ensure that the FSDS goals and targets are considered in policy, plan and program development across government, and improve the overall reporting and supports transparency of the FSDS and SEAs.

Examples where departments and agencies have integrated the new requirements include:

By 2011, the majority of Federal Sustainable Development Strategy departments indicated that the 2010 revisions had been integrated into their organizations' strategic environmental assessment processes to a varying extent (some more fully than others). This integration is ongoing.

- The Canadian Environmental Assessment Agency is updating its SEA course for departmental analysts and other interested practitioners to reflect the revised Guidelines.
- Environment Canada has established a new departmental policy on SEA and has also developed a departmental SEA template that prompts analysts to consider the FSDS goals and targets at all stages of the SEA process.
- In 2011, Citizenship and Immigration Canada launched a Sustainable Development Policy Framework which includes a Policy on Sustainable Development Assessments (SDA). The framework requires that Memoranda to Cabinet and Treasury Board Submissions undergo an SDA. As a result, a sustainable development analysis is completed even where no SEA would be required. Citizenship and Immigration Canada developed SDAs for eight Memoranda to Cabinet in 2011–2012.
- Finance Canada has updated its internal SEA guidance document to help its officials identify and consider FSDS goals and targets when completing SEAs. This includes providing specific information on common environmental issues, as well as their drivers and linkages to FSDS. The guidance document is easily accessible, along with other SEA resources, on the Finance Canada's one-stop internal SEA Web page.
- Parks Canada has revised its preliminary scan form to include consideration of FSDS goals and targets during the preparation of an SEA. In addition, Parks Canada is preparing a new SEA guide that directs environmental assessment practitioners to identify and consider FSDS goals and targets.
- Health Canada created a departmental intranet site to inform and raise awareness of expectations in relation to its new SEA policy. The intranet also contains links to the guidance for the conduct of SEAs and other associated tools. Health Canada also delivered two SEA training sessions following the intranet launch of the policy and tools.

Departments and agencies are also integrating the FSDS goals and targets into their SEA communications and reporting—in particular, into SEA public statements and DPRs. For example:

- Environment Canada's departmental SEA template includes a section on preparing public statements that requires a description of the proposal's effects on the FSDS goals and targets. Environment Canada has also released public statements that include descriptions of initiatives' contributions to implementing the FSDS.

- As part of broader changes to Finance Canada's SEA processes, officials are now asked to include information relating to FSDS goals and targets in SEA public statements. This new element is accessible via the Department's SEA Public Statements Web page for relevant measures in Economic Action Plan 2011 and Economic Action Plan 2012.
- Parks Canada's new guidance on preparing SEA public statements also outlines the requirement to include, in the overview of environmental effects, any impacts on FSDS goals and targets. SEA public statements are posted on Parks Canada's public website.

Managing Sustainable Development in the Federal Government

In order to support the *Federal Sustainable Development Act*, Environment Canada created the Sustainable Development Office, which is responsible for putting in place the systems and procedures to monitor progress on implementing the FSDS. A Management Framework, adopted in June 2011, outlines roles, responsibilities and accountabilities of all the participating departments, committees and stakeholders; clear expectations for outputs and outcomes; indicators to measure performance; and, strategies for communication, risk management and reporting. The Management Framework will be reviewed with every new cycle of the FSDS to ensure that it continues to be a tool that helps manage the implementation of the FSDS.

Corporate Social Responsibility

The FSDS underscores the role of corporations in adopting sustainability as part of successful business strategy. Implementation of Corporate Social Responsibility (CSR) practices helps companies improve their economic, environmental and social performance, benefiting those corporations in many ways, including lowering production and operating costs, stimulating innovation, and expanding market opportunities.

The government promotes CSR in many ways. These range from developing and disseminating information and management tools to help business integrate CSR practices, to working with business networks and associations that advance CSR. Examples are:

- CSR Toolkits and a Small and Medium Enterprises Sustainability Road Map;
- Promoting internationally recognized voluntary CSR performance and reporting standards and practices (e.g., the OECD Guidelines for Multinational Enterprises, the Global Reporting Initiative);
- The Network for Business Sustainability; and,
- The Industry Association Sustainability Council.

Federal initiatives also include:

- The continued implementation of the government's CSR policy, entitled Building the Canadian Advantage: A CSR Strategy for the Canadian International Extractive Sector;
- The creation of the Canadian International Institute for Extractive Industries and Development to provide research, training and technical assistance;
- The Responsible Resource Development plan to streamline the review process for major economic projects while protecting the environment and enhancing consultations with Aboriginal peoples; and,
- The Federal Framework for Aboriginal Economic Development to forge partnerships so that Aboriginal communities can benefit from economic opportunities.

ANNEXES

Annex A: Clean Air Agenda

The Federal Sustainable Development Strategy (FSDS), as a legislated and permanent framework for reporting on federal initiatives supporting sustainable development, is providing the vehicle for reporting on the progress of the Clean Air Agenda (CAA).

The CAA represents collaborative efforts within the federal government and with other jurisdictions to realize health, economic and environmental benefits for Canadians. These efforts work towards: reducing the risk to the health of Canadians and the environment from exposure to air pollution; providing economic benefits and maintaining competitiveness from innovations related to reducing air pollution and addressing climate change; and, reducing the risk to communities, to infrastructure, and to the health and safety of Canadians resulting from climate change.

Since 2007, through the CAA, the Government of Canada has been making tangible improvements in Canada's environment in addressing the challenges of climate change and air pollution. With the renewal of the CAA funding in 2011, these initiatives are organized to respond to key Canadian concerns about climate change and air quality, as follows.

- *Clean Air Regulatory Agenda (CARA)* seeks to reduce greenhouse gas (GHG) and air pollutant emissions by supporting regulatory actions in the industrial, transport, and consumer and commercial products sectors. CARA also supports other important air quality efforts, including the development of codes and standards for indoor air quality.
- *Clean Energy* seeks to improve environmental performance by advancing clean electricity and cleaner energy production, increasing the use of alternative fuels, and improving end-use energy efficiencies.
- *Clean Transportation* aims to reduce GHG and air pollutant emissions from the transportation sector through the development of transportation sector regulations and next-generation clean transportation initiatives.
- *Adaptation* helps Canadians adapt to the challenges of climate change. These initiatives seek to reduce risk to communities, industry, infrastructure, and the health and safety of Canadians while realizing economic benefits and maintaining competitiveness from innovations responding to climate change.
- *International Actions* support the Government of Canada's broad efforts to reduce GHG emissions and address climate change by participating in international partnerships and negotiations, and by ensuring international obligations are met.

The federal partners are: Aboriginal Affairs and Northern Development Canada, Environment Canada, Fisheries and Oceans Canada, Foreign Affairs and International Trade Canada, Health Canada, National Research Council Canada, Natural Resources Canada, Parks Canada, Public Health Agency of Canada, Standards Council of Canada, and Transport Canada.

This 2012 Progress Report, together with the Clean Air Agenda reporting information on departmental websites, supports the reporting for the fiscal year 2011–2012. This being the first year of reporting through the FSDS, the highlights on the CAA performance are captured in the section on Addressing Climate Change and Air Quality, with the details of the program financials (by department) set out below.

Clean Air Agenda 2011–2012 spending, by department

CLEAN AIR AGENDA PROGRAMMING by Department	Planned Spending 2011–2012 ($ millions)	Actual Spending 2011–2012 ($ millions)
Aboriginal Affairs and Northern Development Canada		
ADAPTATION		
Climate Adaptation and Resilience Program for Aboriginals and Northerners	1.35	1.35
Integrating Adaptation into Codes and Standards for Northern Infrastructure	0.19	0.19
CLEAN ENERGY		
ecoENERGY for Aboriginal and Northern Communities	3.93	3.93
Environment Canada		
ADAPTATION		
Climate Change Prediction and Scenarios Program	5.74	3.28
CLEAN AIR REGULATORY AGENDA		
Analysis in Support of Regulations	3.42	2.76
Atmospheric Pollutants Policy	6.24	2.35
Atmospheric Research, Monitoring and Modelling	17.48	10.41
Compliance Promotion and Enforcement	6.89	5.06
Consumer and Commercial Products Regulations	1.86	1.48
Cross-Cutting Analysis	3.22	2.60
Cross-Cutting Data Collection and Reporting	3.10	1.34
Data Collection and Reporting for Atmospheric Pollutants	8.20	7.30
Data Collection and Reporting for Greenhouse Gases	10.76	4.50
Electricity Regulations	3.11	1.89
Emissions-Intensive Trade-Exposed (EITE) Regulations	8.66	4.74
Health and Environmental Impacts of Air Pollutants	3.06	3.04
Greenhouse Gas Policy	12.83	6.31
Oil and Gas Regulations	6.60	3.30
Oil Sands Science	2.84	2.38
Science Integration, Accountability and Benefits of Action	0.60	0.53
Transportation Regulations	11.54	8.96
CLEAN TRANSPORTATION		
Marine Sector Regulatory Initiative	1.83	0.46
Vehicle Scrappage*	1.20	1.05
INTERNATIONAL ACTIONS		
Engagement and Alignment with the U.S. (U.S.-Canada Clean Energy Dialogue)	0.85	0.69
International Climate Change Obligations	0.34	0.32
International Climate Change Participation/Negotiations	4.80	5.52

* Includes funding from CAA 2007–2011.

CLEAN AIR AGENDA PROGRAMMING by Department	Planned Spending 2011–2012 ($ millions)	Actual Spending 2011–2012 ($ millions)
Fisheries and Oceans Canada		
ADAPTATION		
Aquatic Climate Change Adaptation Services Program	1.84	1.62
Foreign Affairs and International Trade Canada		
INTERNATIONAL ACTIONS		
International Climate Change Obligations	0.48	0.48
International Climate Change Participation/Negotiations	1.42	1.37
Health Canada		
ADAPTATION		
Climate Change and Health Adaptation for Northern First Nations and Inuit Communities	0.57	0.46
Heat Alert and Response Systems (Heat Resiliency Program)	1.58	2.00
CLEAN AIR REGULATORY AGENDA		
Atmospheric Pollutants Policy	5.18	3.95
Atmospheric Research, Monitoring and Modelling	5.92	4.39
Data Collection and Reporting for Atmospheric Pollutants	2.68	2.71
Health and Environmental Impacts of Air Pollutants	2.62	1.81
Indoor Air Quality Management – Biological and Chemical Contaminants	1.86	1.56
Indoor Air Quality Management – Radioactive Contaminants	6.10	4.97
Science Integration, Accountability and Benefits of Action	3.10	2.09
National Research Council Canada		
CLEAN AIR REGULATORY AGENDA		
Indoor Air Quality Strategies and Solutions	1.80	1.78

CLEAN AIR AGENDA PROGRAMMING by Department	Planned Spending 2011–2012 ($ millions)	Actual Spending 2011–2012 ($ millions)
Natural Resources Canada		
ADAPTATION		
Enhancing Competitiveness in a Changing Climate – Forest Disturbances Science and Application (Canadian Forest Service) – Climate Change Geoscience and Adaptation (Minerals and Metals Sector) – Climate Change Geoscience and Adaptation (Earth Sciences Sector)	 1.00 0.20 2.75	 0.92 0.20 2.14
Innovative Risk Management Tools/Regional Adaptation Action Partnerships*	11.00	10.80
CLEAN ENERGY		
Clean Energy Policy	2.33	1.54
ecoENERGY for Alternative Fuels	0.77	0.48
ecoENERGY Efficiency	38.04	34.44
ecoENERGY Innovation Initiative	24.23	19.07
ecoENERGY Retrofit – Homes	400.00	211.43
ecoENERGY for Renewable Power*	139.51	127.05
ecoENERGY Technology Initiative*	48.71	43.24
Marine Renewable Energy Enabling Measures	0.57	0.42
INTERNATIONAL ACTIONS		
Engagement and Alignment with the U.S. (U.S.-Canada Clean Energy Dialogue)	1.15	1.11
International Climate Change Participation/Negotiations – International Participation/Negotiations in Climate Change – Forest Carbon Policy and Monitoring	 1.11 1.98	 1.13 1.85
Parks Canada		
ADAPTATION		
Understanding Climate-Driven Ecological Changes in Canada's North	0.52	0.52
Public Health Agency of Canada		
ADAPTATION		
Climate and Infectious Disease Alert and Response System to Protect the Health of Canadians*	0.25	0.25
Preventative Public Health Systems and Adaptation to a Changing Climate	1.64	1.59
Standards Council of Canada		
ADAPTATION		
Integrating Adaptation into Codes and Standards for Northern Infrastructure	0.50	0.50

* Includes funding from CAA 2007–2011.

CLEAN AIR AGENDA PROGRAMMING by Department	Planned Spending 2011–2012 ($ millions)	Actual Spending 2011–2012 ($ millions)
Transport Canada		
ADAPTATION		
Northern Transportation Adaptation Initiative	0.36	0.36
CLEAN TRANSPORTATION		
Aviation Sector Regulatory Initiative	2.08	1.48
ecoMobility*	1.10	0.45
ecoTECHNOLOGY for Vehicles II Initiative	4.60	3.88
Gateway Carbon Footprint Initiative	0.15	0.06
Marine Sector Regulatory Initiative	3.47	2.93
Marine Shore Power Program*	1.20	1.04
Rail Sector Regulatory Initiative	1.65	1.23
Shore Power Technology for Ports Program	0.45	0.39
Support for Vehicle Greenhouse Gas Emissions Regulations	1.60	1.43
Truck Reservation System Program	0.06	0.01

NOTE: Figures exclude Public Works and Government Services Canada accommodation costs.

* Includes funding from CAA 2007–2011.

For more information regarding the CAA, please consult the following websites: Aboriginal Affairs and Northern Development Canada, Environment Canada, Fisheries and Oceans Canada, Foreign Affairs and International Trade Canada, Health Canada, National Research Council Canada, Natural Resources Canada, Parks Canada, Public Health Agency of Canada, Standards Council of Canada, and Transport Canada.

Annex B: Canadian Environmental Sustainability Indicators Methods for Indicator Selection, Development and Production

As part of its broader commitment to transparency in environmental decision-making, the government has made the Canadian Environmental Sustainability Indicators (CESI) program a permanent feature of its environmental reporting. CESI has significantly expanded the number of indicators to measure progress towards the goals and targets of the Federal Sustainable Development Strategy (FSDS), and its data is found throughout this report. The indicators tracking the progress of the FSDS are prepared by Environment Canada with the support of other federal government departments, such as Health Canada, Statistics Canada, Natural Resources Canada, Agriculture and Agri-Food Canada, Fisheries and Oceans Canada, Aboriginal Affairs and Northern Development Canada, as well as provincial and territorial government departments. Designed to be relevant to the Government of Canada's policies, the indicators are built on rigorous methodology, and high-quality, regularly available data from surveys and monitoring networks.

The CESI program provides objective and comprehensive information on environmental trends in a straightforward and transparent manner. It ensures that national, regional, local and international trends are readily accessible and presented through the use of graphics, explanatory text and interactive maps, through which users can drill down for local data. CESI further supports transparency by publishing comprehensive explanations of indicator methodologies and making indicator data available for download, through both the CESI website (www.ec.gc.ca/indicateurs-indicators) and the Open Data Pilot Project (www.data.gc.ca). CESI has also changed formats, moving from an annual report to a website to which indicators are frequently added and updated as new data becomes available.

The CESI program implements key steps to ensure the quality of indicator data and information, including indicator selection, indicator development and production.

Selecting the Indicators and Applying the Criteria

Indicator selection informs the choice of indicators and data to ensure effective measurement of progress of the goals and targets of the FSDS. Criteria adopted from the Organisation for Economic Co-operation and Development, Bellagio Principles, and the Statistics Canada Quality Assurance Framework were applied in choosing appropriate indicators. These criteria include:

1. Policy relevance (represents the FSDS goals and targets or otherwise related to Environment Canada's mandate);
2. Utility (meets the needs of decision-makers and the public in that it is understandable and provide relevant context for decisions);
3. Soundness (provides consistent and solid methodology, is scientifically credible and comparable over time); and,
4. Data availability (uses existing high-quality data with adequate coverage).

Indicator selection is done in conjunction with the setting of FSDS targets as part of each three-year cycle of the FSDS. Existing indicators are reviewed and new ones considered in the context of the goals and targets. Indicators are selected based on consultations between scientists, indicator specialists, policy analysts, program managers and other experts in relevant government departments and agencies. The focus of these reviews begins with the first criterion of policy relevance, since the indicator must be relevant for measuring or estimating trends in the final outcome in the environment by FSDS goal or target area. Considerations then broaden to assess the extent to which an indicator can fully meet the criteria. An "indicator profile" is prepared that captures metadata on the indicators (indicator description, partner contacts, data availability, methodology, caveats, etc.) and documents how an indicator meets the criteria. Information on the limitations

of the indicator is included. Data availability, for instance, can often be qualified if coverage is limited or a time series is not available. In some cases, an indicator proceeds even with limitations, given that it is the best available information. Over time, the aim is to bring about indicator improvements to meet the criteria more effectively.

Developing the Indicators

For new or improvements to existing indicators, a development process is used along the following steps:

1. Research and consultation (may be done in sequence or together):
    a. Background research on the issue and measurement strategies to develop one or more options for what parameters will be tracked and how they will be presented. (This may include supplemental work on regional, local and international versions of the indicator if appropriate.)
    b. Consult with science experts and data providers in the issue area to discuss and revise the option(s).
2. Technical proposals are prepared, based on the indicator profiles and the research and consultations that have been done. These help to document development decisions and to outline methodology direction and rationale (with options if appropriate.)
3. Finalize with partners the data sources and methods for selecting parameters, calculations and reporting the indicators.

Producing the Indicators

Indicators proceed through the production process as per the following steps:

1. Indicator data collection:
    - Data is obtained from source program partners and data transformation processes are confirmed.
    - Data for interactive maps is obtained from source program partners, and this includes relevant mapping data and metadata along with confirmation of data transformation processes and the mechanism for ongoing integration into the CESI mapping application.
2. Data, Sources and Methods (DSM) documentation:
    - The DSM is developed to present the metadata for the indicator. It includes an indicator rationale, a description of methods, spatial and temporal coverage of the data, and caveats and limitations.
3. Indicator calculation and content development:
    - The indicator is calculated based on the data obtained from source program partners, and calculated in accordance with the DSM documentation. The indicator content is developed based on the results of the calculation, and by providing contextual interpretation of these results through explanatory text and graphical presentation of the indicator.
4. Technical review:
    - The indicator content and DSM are provided to source program partners and other relevant partners for their review and comment. Their requested changes are documented in a disposition table that also notes actions taken to address specified comments.
5. Final approvals:
    - The indicator content and DSM are provided to the management of program partners and Environment Canada senior management for final approvals.
6. Final production steps and public release
    - Translation and web product development are completed, including the final production images used for indicator charts and testing of the interactive mapping application. After these steps, the CESI indicator is released publicly.

Underlying all this, Environment Canada undertakes exploratory research to determine if new indicators are possible to fill existing gaps or forthcoming environmental policy priorities detected in national and international fora.

Annex C: List of Departments/Agencies Bound by the *Federal Sustainable Development Act*

1. Department of Agriculture and Agri-Food
2. Department of Canadian Heritage
3. Department of Citizenship and Immigration
4. Department of the Environment
5. Department of Finance
6. Department of Fisheries and Oceans
7. Department of Foreign Affairs and International Trade
8. Department of Health
9. Department of Human Resources and Skills Development*
10. Department of Indian Affairs and Northern Development
11. Department of Industry
12. Department of Justice
13. Department of National Defence
14. Department of Natural Resources
15. Department of Public Safety and Emergency Preparedness
16. Department of Public Works and Government Services
17. Department of Social Development*
18. Department of Transport
19. Treasury Board Secretariat of Canada
20. Department of Veterans Affairs
21. Western Economic Diversification Canada
22. Atlantic Canada Opportunities Agency
23. Canada Border Services Agency
24. Canada Revenue Agency
25. Canadian International Development Agency
26. Canada Economic Development for Quebec Regions
27. Parks Canada Agency
28. Public Health Agency of Canada

* These two departments have merged responsibilities.

Annex D: Applicability of Greening Government Operations Targets

Departments	Green Buildings[1]	Green Procurement	E-waste, Managed Print, Paper Consumption and Green Meetings	GHG Emissions from Buildings and Fleet	GHG Emissions from Fleet Only
Agriculture and Agri-Food Canada	✓	✓	✓	✓	
Atlantic Canada Opportunities Agency		✓	✓		
Canada Border Services Agency	✓	✓	✓	✓	
Canada Revenue Agency		✓	✓		✓
Canadian Heritage		✓	✓		
Canadian International Development Agency		✓	✓		
Citizenship and Immigration Canada		✓	✓		✓
Canada Economic Development for Quebec Regions		✓	✓		
Environment Canada	✓	✓	✓	✓	
Finance Canada		✓	✓		
Fisheries and Oceans Canada	✓	✓	✓	✓	
Foreign Affairs and International Trade Canada		✓	✓		
Health Canada	✓	✓	✓		✓
Human Resources and Skills Development Canada		✓	✓		✓
Indian and Northern Affairs Canada (Aboriginal Affairs and Northern Development Canada)	✓	✓	✓		✓
Industry Canada	✓	✓	✓		✓
Justice Canada		✓	✓		
National Defence	✓	✓	✓	✓	
Natural Resources Canada	✓	✓	✓	✓	
Parks Canada	✓	✓	✓	✓	
Public Health Agency of Canada	✓	✓	✓		
Public Safety Canada		✓	✓		
Public Works and Government Services Canada	✓	✓	✓	✓	
Transport Canada	✓	✓	✓	✓	
Treasury Board of Canada Secretariat		✓	✓		
Veterans Affairs Canada	✓	✓	✓		
Western Economic Diversification Canada		✓	✓		

Notes:

[1] Green buildings targets apply to custodian departments and agencies bound by the *Federal Sustainable Development Act*.

www.ec.gc.ca

Additional information can be obtained at:

Environment Canada
Inquiry Centre
10 Wellington Street, 23rd Floor
Gatineau QC K1A 0H3
Telephone: 1-800-668-6767 (in Canada only) or 819-997-2800
Fax: 819-994-1412
TTY: 819-994-0736
Email: enviroinfo@ec.gc.ca