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ACHIEVING A SUSTAINABLE FUTURE

PROGRESS REPORT ON THE 2016 TO 2019 FEDERAL SUSTAINABLE DEVELOPMENT STRATEGY

2018

Canada

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MESSAGE FROM THE MINISTER

It is with great pleasure that I present the *2018 Progress Report on the 2016 to 2019 Federal Sustainable Development Strategy* (FSDS) to Parliament and Canadians.

We've taken on board suggestions for improving the Progress Report by adding a new progress scorecard and rating system, so you can see at a glance where we're doing well and where more work is needed.

This Report also provides information about the progress made to date under the 2016 to 2019 FSDS to further sustainable development in Canada. It provides a snapshot of the level of progress made in achieving the goals and targets of the FSDS based on the best available scientific evidence that has been thoroughly reviewed by subject matter experts. Conclusions about trends are only reached after review of several cycles of monitoring. The Report also helps us identify the sustainable development challenges ahead as we prepare the next Strategy.

Of the 26 targets in the 2016 to 2019 Federal Sustainable Development Strategy, this 2018 Progress Report shows that 1 has been achieved, 16 are on track, 5 require attention and, for the remaining 4, there is insufficient data to report within this 3-year cycle.

This Report highlights the leadership role Canada has taken in working towards zero plastic waste, in implementing measures to conserve marine areas, as well as actions on climate change, including reducing greenhouse gas emissions from government operations.

And it acknowledges there is more work to be done, particularly in managing fish harvest, terrestrial protected areas, ecological integrity of national parks, and species at risk. Keeping in mind that recovery in the natural environment takes time, this 3 year cycle may not fully reflect the recovery underway, as indicated by changes to beneficial use in the Great Lakes Areas of Concern.

I would like to express my appreciation to the 41 federal departments and agencies that have worked diligently with my department to produce this Progress Report. The Report is provided in the spirit of transparency and accountability required under the *Federal Sustainable Development Act*.

On a personal note, I am pleased with the contributions made to advance sustainable development over the past 3 years. During Canada's 150th anniversary of Confederation I was especially proud of the activities in our parks and green spaces that included encouraging Canadians to participate in conservation.

Sincerely,

The Honourable Catherine McKenna
Minister of Environment and Climate Change
@ec_minister

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PROGRESS TOWARDS OUR TARGETS

The 2016 to 2019 Federal Sustainable Development Strategy (the Strategy) presents 13 aspirational goals supported by measurable targets and clear actions. These are all aimed at realizing the vision that Canada is one of the greenest countries in the world and where the quality of life continues to improve.

This scorecard shows how, after 2 years, the Government of Canada is progressing in implementing the Strategy. It shows where the Government of Canada is achieving its targets and where more work is needed. In keeping with a commitment to continually improve, these progress results will be used to inform the development of the next Federal Sustainable Development Strategy.

Help spread the word about progress on sustainable development! Share these results on social media using the hashtags #GCresults and #SustDev.

Goals	2016 to 2019 Federal Sustainable Development Strategy Targets	Achieved	On track – underway	Attention required	New data not available
	Reduce Canada's total GHG emissions by 30% by 2030, relative to 2005 emission levels		✓		
	Reduce federal government GHG emissions by 40% by 2030		✓		
	Implement our Mission Innovation commitment to double federal government investments in clean energy by 2020		✓		
	Invest $20 billion in funding for green infrastructure initiatives by 2025 to 2026		✓		
	Increase overall renewable electricity capacity yearly, from the 2014 level of 64.4%		✓		
	Generate 90% by 2030 and in the long term, 100% of Canada's electricity from renewable and non-emitting sources		✓		
	Contribute to the North American goal of 50% clean power generation by 2025		✓		
	Conserve 10% of coastal and marine areas through networks of protected areas and other effective area-based conservation measures by 2020		✓		
	Manage and harvest all fish and invertebrate stocks and aquatic plants sustainably, by applying ecosystem-based approaches by 2020			✓	
	Reduce phosphorus loading into Lake Erie by 40% to achieve the binational (Canada-US) phosphorus targets from a 2008 baseline				✓
	Reduce an additional estimated 2000 kilograms of phosphorus loadings to Lake Simcoe	✓			
	Achieve a result considered intermediate or better on 85% of the indicators of the *Overview of the State of the St. Lawrence* by 2019				✓

Goals	2016 to 2019 Federal Sustainable Development Strategy Targets	Achieved	On track – underway	Attention required	New data not available
	Restore beneficial uses to assist in delisting 5 Canadian Great Lakes Areas of Concern and increase the number of beneficial use impairment re-designations from 18 in 2014 to 30 by 2019			✓	
	Conserve at least 17% of terrestrial areas and inland water through networks of protected areas and other effective area-based conservation measures by 2020			✓	
	Maintain and improve the condition of 90% of ecological integrity indicators in national parks by 2019			✓	
	Maintain Canada's annual timber harvest at or below sustainable wood supply levels between now and 2020		✓		
	Ensure species that are secure remain secure, and populations of species at risk listed under federal law exhibit trends that are consistent with recovery strategies and management plans by 2020			✓	
	Ensure 59% of managed migratory bird species have population sizes within an acceptable range by 2025				✓
	Ensure 60% by March 31, 2019, and by March 31, 2021, 100% of the long-term drinking water advisories affecting First Nation drinking water systems financially supported by Indigenous Services Canada are resolved		✓		
	Ensure safe and accessible food supply by mitigating risks to animal and plant resources from pests, diseases and other health hazards and prevent risks to health of Canadians		✓		
	All aquaculture in Canada is managed under a science-based regime that promotes the sustainable use of aquatic resources (marine and freshwater) in ways that conserve biodiversity by 2020		✓		
	Provide a stable or improved level of biodiversity in agricultural working landscapes to ensure efficient management towards water and soil quality for food production by 2030				✓
	Increase or maintain the number of Canadians that visit parks and green spaces – and increase participation in biodiversity conservation activities relative to a 2010 baseline by 2020		✓		
	Implement the Air Quality Management System to decrease the 3-year average of fine particulate matter, nitrogen oxides and volatile organic compound emissions from regulated and/or targeted sources to below the previous 3-year average by 2020		✓		
	Implement the Air Quality Management System to increase the percentage of the Canadian population living in areas where measured outdoor concentrations are below the Canadian Ambient Air Quality Standards for fine particulate matter and ozone by 2020		✓		
	Address the 4300 substances identified as priorities for action under the Chemicals Management Plan by 2020		✓		

ABOUT THIS REPORT

The 2016 to 2019 Federal Sustainable Development Strategy (the Strategy) presents 13 aspirational goals supported by measurable targets and clear actions. These are all aimed at realizing the vision that Canada is one of the greenest countries in the world and where the quality of life continues to improve for all Canadians.

This report details how, after 2 years of effort by 41 federal departments and agencies, the Government of Canada is progressing in implementing the Strategy. The data in this report are current as of October 1, 2018, unless stated otherwise.

This report shows where the Government of Canada is achieving its targets and where more work is needed. These progress results have informed the development of the next Federal Sustainable Development Strategy.

For each of the 13 goals, this report sets out:

- why the goal is important;
- overall progress towards targets;
- detailed results for targets and milestones, and key actions taken;
- information on risks and challenges;
- examples of innovative work outside the federal government; and
- linkages with the United Nations 2030 Agenda for Sustainable Development and other international agreements and initiatives.

Continuous improvement is a core principle of the Strategy and its reporting. This report improves on past Federal Sustainable Development Strategy progress reports by:

- incorporating a new progress scorecard and rating system to clearly communicate and summarize results;
- providing more information about challenges in achieving the targets;
- including more visual elements to make progress information clearer and more accessible;
- providing more information on specific funding and spending initiatives; and
- linking to a foundation of information about federal actions and results, such as:
  - the GC InfoBase, a whole-of-government platform for information on federal spending and performance metrics;
  - the mandate letter tracker, which shows completion status of all mandate letter commitments, linked to 12 top government priorities;
  - departmental results reports, which include annual reporting on sustainable development commitments; and
  - using indicators from the Canadian Environmental Sustainability Indicators (CESI) program.

Help spread the word about progress on sustainable development! Share these results on social media using the hashtags **#GCresults and #SustDev**.

PROGRESS ON CROSS-CUTTING PRIORITIES

In addition to goals, targets, milestones and actions, the Strategy sets out cross-cutting priorities that support progress on priorities of the Government of Canada. Since the Strategy was tabled in 2016, progress has been made on:

- spearheading emerging sustainable development issues;
- implementing the 2030 Agenda for Sustainable Development;
- strengthening support for informed and sustainable decision making across government;
- supporting the essential role of business in advancing sustainability; and
- the introduction of legislation to reform environmental and regulatory processes.

EMERGING SUSTAINABLE DEVELOPMENT ISSUES

Globally, it is estimated that more than 8 million tonnes of plastic enter the oceans every year resulting in at least $13 billion in damages to marine ecosystems and $90 to $120 billion in lost economic value worldwide. Recognizing the significant threat that plastics pose to our oceans, as part of its G7 presidency, Canada spearheaded the development of an Ocean Plastics Charter in 2018.

G7 AND THE OCEAN PLASTICS CHARTER

Leaders from Canada, France, Germany, Italy, the United Kingdom, and the European Union at Charlevoix (Quebec) adopted the Charter in June 2018. It advances ambitious targets and solutions for domestic and international action to reduce plastic waste and marine litter. Domestically, federal, provincial and territorial governments are working together through the Canadian Council of Ministers of the Environment to move towards a circular economy for plastics by pursuing a zero plastic waste approach, with a vision of keeping all types of plastic in the economy, and out of landfills.

The Government of Canada also committed to diverting at least 75% of the plastic waste from government operations by 2030 at the G7 Environment and Oceans Ministerial Meeting in Halifax in September 2018. Sixty-five (65) million dollars in new funding was announced to support plastic waste reduction in developing countries, $12 million to support Canadian innovations aimed at reducing the flow of plastics into the oceans and $20 million for the G7 Plastics Innovation Challenge.

2030 AGENDA FOR SUSTAINABLE DEVELOPMENT

Adopted by United Nations member states in 2015, the 2030 Agenda is a global framework of action for people, planet, prosperity, peace, and partnership. It includes 17 Sustainable Development Goals (SDGs) and 169 targets that apply to all countries.

The Government of Canada is committed o supporting the implementation of the 2030 Agenda and its SDGs, both within Canada and internationally. The Strategy demonstrates that commitment, presenting goals that reflect the environmentally-focused SDGs and many initiatives that align with the 2030 Agenda.

For example, Canada's

- Feminist International Assistance Policy seeks to eradicate poverty and build a more peaceful, inclusive and prosperous world. Canada believes that promoting gender equality and empowering women and girls is the most effective approach to achieving this goal;
- the Recognition and Implementation of Rights Framework lays the foundation for change reconciliation and a renewed relationship with Indigenous peoples; and
- investments in clean economic growth and international climate finance support the implementation of the Pan-Canadian Framework on Clean Growth and Climate Change.

Through Budget 2018, the Government of Canada allocated $49.4 million over 13 years, starting in 2018-19, to establish an SDG Unit to coordinate Canadian efforts to advance the SDGs both internationally and domestically and fund monitoring and reporting activities by Statistics Canada. Up to $59.8 million over 13 years, starting in 2018-19, will also be provided from existing departmental resources for programming to support the implementation of the SDGs in Canada.

This includes developing a National Strategy in collaboration with provinces and territories, Indigenous peoples, municipalities, civil society, the private sector, and other relevant stakeholders; raising public awareness of, and support for the 2030 Agenda; and fostering inclusive and innovative partnerships and networks to advance the SDGs, as well as the administration of a funding program for innovative and horizontal initiatives that support their achievement.

An SDG Unit is being established to coordinate, monitor and report on activities related to the implementation of the National Strategy and funding program. Federal ministers, departments and agencies area all responsible for implementing the 2030 Agenda and supporting the development of the National Strategy. Federal departments and agencies are looking at how their policies and programs are contributing to the 2030 Agenda's goals and targets, with a view to identifying gaps and areas where accelerated action is needed.

In July 2018, Canada presented its first Voluntary National Review to the United Nations High-Level Political Forum. This review took stock of national actions, achievements and challenges in implementing the 2030 Agenda. This is a starting point, not an end, providing a view of current actions and the path for further action in Canada on the 2030 Agenda and the SDGs.

Canada is contributing to efforts around the world to measure and report on the 2030 Agenda. This includes tracking and reporting Canada's performance on the global suite of SDG indicators. Explore Canada's progress towards the SDGs by visiting Statistics Canada's SDG Data Hub.

The FSDS is a key element of Canada's response to the 2030 Agenda. It sets out what the Government of Canada will do over a 3-year period to support the SDGs, with the focus on their environmental dimensions. However, implementing the SDGs goes beyond the federal government alone. Actions to implement the FSDS will contribute to the broader National Strategy to achieve the 2030 Agenda and leave no one behind.

TALKING WITH CANADIANS

When the 2016 to 2019 Strategy was tabled, there was a commitment to continue talking with Canadians about their ideas and actions to advance sustainability. This commitment has been met, and continues to be met, by hosting numerous public webinars (16), presenting at conferences and giving seminars (24) on sustainable development topics with more than 2500 Canadians. Social media has and is being used to share results and learn what Canadians are doing for a greener Canada.

Get involved!

- E-mail ec.durabilite-sustainability.ec@canada.ca to join ECCC's mailing list or to register for upcoming webinars.
- Search social media using the hashtag #susdev.

KEEPING THE STRATEGY UP TO DATE

For the first time, the Strategy included a commitment to provide updates on a regular basis, not just every 3 years. As a result, 2 updates have been published to the online version of the Strategy. These updates have:

- helped Canadians track progress by providing early results for short-term milestones;
- incorporated specific departmental commitments to provide a complete view of actions implementing the Strategy; and
- enabled the Strategy to reflect key policy decisions taken since it was tabled, such as adoption of the Pan-Canadian Framework on Clean Growth and Climate Change.

Read the updates!

- Spring 2017 update
- Fall 2017 update

DECISION MAKING FOR SUSTAINABLE DEVELOPMENT

Decisions that affect sustainable development happen across the government. To ensure decision makers have the information they need to fully consider environmental sustainability, a Cabinet directive requires that all departments and agencies carry out strategic environmental assessments, or SEAs, for their proposed policies, plans and programs. SEAs are made available to the public, and an example can be found here.

Past audits by the Commissioner of the Environment and Sustainable Development concluded that many departments and agencies were not fully applying the directive. The Federal Sustainable Development Strategy reaffirmed the government's commitment to applying SEA, promising to make decisions based on evidence and setting a higher bar for openness and transparency in government.

Since tabling the Strategy, guidance for departments has been improved to support better SEAs going to Cabinet and Treasury Board. Departments and agencies have also continued to strengthen their SEA tools and practices. For example:

- Health Canada expanded its SEA outreach by launching a new online course, updating guidance, and developing materials for all-staff meetings, new employee orientation sessions and National Public Service Week.
- Innovation, Science and Economic Development Canada launched an SEA Advisor Network to improve integration of SEA analysis into proposals, raise awareness of the SEA process, and build SEA capacity in the department.
- Environment and Climate Change Canada developed an online and classroom training program, updated its SEA policy and guidance, and improved SEA's internal online presence.

Departments and agencies also continue to include commitments and results related to SEA in their individual departmental sustainable development strategies and reports.

WORKING WITH BUSINESS FOR SUSTAINABLE DEVELOPMENT

Canadian businesses play an important role in advancing sustainable development. There is a commitment to continue working with business to develop Canada's national strategy for achieving the SDGs and also take action to support and strengthen the role of business in sustainability.

In January 2018, several initial steps were taken: 2 new initiatives were announced that will strengthen the approach to promoting corporate responsibility by Canadian companies abroad.

- A Canadian Ombudsperson for Responsible Enterprise will address complaints related to allegations of human rights abuses arising from a Canadian company's activity.
- A multi-stakeholder Advisory Body on Responsible Business Conduct will provide advice on responsible business conduct abroad.

Other measures are underway to promote corporate responsibility and support innovative companies.

- In November 2017, consultations with clothing companies were launched on a proposed approach to ethical procurement.
- A Social Innovation and Social Finance Strategy is being developed to support the private sector in finding solutions to persistent social problems, including those facing vulnerable populations.
- The Business Development Bank of Canada has worked with B-Lab (the body that certifies B corps) to develop a simple, free online assessment that enables entrepreneurs to benchmark their companies against B Corp standards and peers around the world.
- Established in 2017, 6 Economic Strategy tables support innovation in advanced manufacturing, agri-food, clean technology, digital industries, health/bio-sciences and resources of the future.

GLOBAL COMPACT NETWORK CANADA

Global Compact Network Canada includes 85 Canadian organizations across multiple industries and sectors. Along with companies in more than 160 countries around the world who have signed on to the UN Global Compact, its members have committed to implementing 10 core principles related to human rights, labour, environment, anti-corruption and taking action to support the SDGs.

The network conducts an annual survey to understand the views of Canadian organizations on the SDGs. The 2018 results highlight the potential for more public-private-civil-society partnerships to achieve global goals. ZACH 2.0 is a current example: the partnership of Global Affairs Canada, Teck Resources, and Nutrition International provides lifesaving zinc and oral rehydration salts to children in need.

ENVIRONMENTAL AND REGULATORY PROCESSES

The Strategy reflects a commitment to restore lost protections and rebuild public trust in Canada's environmental assessment and regulatory review processes. To meet that commitment, an Expert Panel was established and extensive consultations have occurred. More than 1000 online comments and 160 submissions were received and 100 in-person meetings were held to seek input on the Panel's report. The Government of Canada also published a Discussion Paper outlining its proposed approach and engagement with Indigenous peoples, provinces and territories, industry, civil society and the public (more than 100 meetings, 1000 online comments, 357 submissions).

In 2018, proposed legislation was introduced that would put in place better rules to protect Canada's environment, fish, and waterways and rebuild public trust in how decisions about resource development are made. Bill C-68 would amend the *Fisheries Act* by providing:

- restored protections for fish habitat;
- enhanced marine protection and habitat restoration;
- better management of projects;

- preservation of independent inshore fisheries; and
- stronger roles for Indigenous peoples in project reviews, monitoring and policy development.

Under Bill C-69, the proposed *Impact Assessment Act* would repeal and replace the *Canadian Environmental Assessment Act 2012* and decisions on projects would be guided by science, evidence and Indigenous knowledge. Reviews would happen in partnership with Indigenous Peoples, as well as with provinces and territories, and communities will have their voices heard from the start. Companies would have more clarity about what is required of them and review timelines would be more predictable. Project reviews would be both more rigorous and more efficient, with reduced legislated timelines and clearer requirements from the start. Other improvements would include:

- project reviews that consider a wide range of positive and negative impacts on the economy, health, Indigenous rights and communities, in addition to the environment;
- more timely and predictable review processes;
- measures to advance reconciliation and partnership with Indigenous peoples; and
- reduced duplication and red tape through a "one project, one review" approach.

Through amendments to the *Navigation Protection Act*, Bill C-69 would also restore protection for every navigable waterway in Canada. Both Bill C-68 and Bill C-69 are currently before the Senate.

Learn more!

- Better rules to protect Canada's environment and grow the economy;
- Bill C-68, An Act to amend the Fisheries Act and other Acts in consequence;
- Bill C-69, An Act to enact the Impact Assessment Act and the Canadian Energy Regulator Act, to amend the Navigation Protection Act and to make consequential amendments to other Acts.

RENEWING THE SUSTAINABLE DEVELOPMENT APPROACH – BILL C-57

Since tabling the Strategy in 2016 reforms have been proposed to the *Federal Sustainable Development Act* (the Act), the law that requires the Government of Canada to table and report on strategies every 3 years. Bill C-57 was introduced in June 2017 and, as of October 2018, is before the Senate. This Bill responds to recommendations of the House of Commons Standing Committee on Environment and Sustainable Development to provide for more effective, inclusive and accountable strategies by:

- revising the Act's purpose from being primarily about transparency and accountability to greater focus on advancing sustainable development and improving the quality of life for Canadians;
- incorporating new principles, such as intergenerational equity, while continuing to reflect existing ones like the precautionary principle;
- expanding the number of federal organizations required to prepare sustainable development strategies from 26 to more than 90;
- strengthening the multi-stakeholder Sustainable Development Advisory Council by doubling representation of Indigenous peoples from 3 members to 6 on a council of 29 members;
- requiring targets in the Strategy to be measurable and include a time frame; and
- introducing a new requirement for federal organizations to report each year to parliamentarians on the progress of implementing their organization's sustainable development strategy.

LEARN MORE!

- Federal Sustainability for Future Generations, a Report Following an Assessment of the Federal Sustainable Development Act
- Bill C-57, an Act to amend the Federal Sustainable Development Act

EFFECTIVE ACTION ON CLIMATE CHANGE

Responsible Minister: Minister of Environment and Climate Change, supported by a whole-of-government approach to implementation and 19 key departments and agencies

A LOW-CARBON ECONOMY CONTRIBUTES TO LIMITING GLOBAL AVERAGE TEMPERATURE RISE TO WELL BELOW 2 DEGREES CELSIUS AND SUPPORTS EFFORTS TO LIMIT THE INCREASE TO 1.5 DEGREE CELSIUS.

THIS CAN BE ACHIEVED THROUGH INCREASING EFFORTS TO REDUCE GREENHOUSE GAS (GHG) EMISSIONS, AND BY SUPPORTING ENHANCED COLLABORATION AND PARTNERSHIPS INCLUDING THROUGH THE PAN-CANADIAN FRAMEWORK ON CLEAN GROWTH AND CLIMATE CHANGE.

WHY IT'S IMPORTANT

Climate change is a critical global problem that poses significant risks to human health, ecosystems, security, economic growth, and the ability of future generations to meet their basic needs.

For Indigenous and remote communities in the North, the impacts are disproportionately large: reduced sea ice, snow cover and shrinking glaciers disrupt travel routes; thawing permafrost threatens homes and infrastructure; and decreased availability of country foods affects food security.

Recent extreme weather events linked to climate change across Canada have also had considerable negative environmental, health, social and economic impacts. A changing climate presents a range of challenges that cut across regions, sectors, disciplines and communities.

PAN-CANADIAN FRAMEWORK

In 2016, federal, provincial and territorial governments agreed to the Pan-Canadian Framework on Clean Growth and Climate Change (Pan-Canadian Framework) to reduce Canada's GHG emissions by 30% below 2005 levels by 2030 and build resilience to the impacts of climate change. This framework is the first climate change plan in Canada's history to include collective and individual commitments by federal, provincial and territorial governments, and reflects the engagement of national representatives of First Nations, Inuit and the Métis Nation, the general public, non-governmental organization and businesses.

ADAPTATION IS REQUIRED – CLIMATE CHANGE HAS A HAND IN EXTREME WEATHER EVENTS

Climate change is happening. Extreme weather, warming and coastal erosion need to be managed. Urban planning that considers the risks of a changing climate and extreme weather events could help Canadians communities become more resilient to situations such as the wildfires that struck Fort McMurray in 2016, and the flooding in the Ottawa Valley in 2017.

The 2016 Fort McMurray wildfire displaced 90,000 people, destroyed approximately 2400 homes and buildings, and disrupted local economic activities. This fire required the biggest insurance payout in Canada's history: $3.58 billion in damages.

In early May 2017, strong and prolonged rains caused historic floods in eastern Ontario and western Quebec. The flooding drove thousands of people from their homes, caused costly damage and required more than 2600 Canadian Armed Forces personnel from Operation LENTUS to assist relief efforts.

ACHIEVEMENTS

TARGET

By 2030, reduce Canada's total GHG emissions by 30%, relative to 2005 emission levels.

RESULT

Between 2005 and 2016, GHG emissions decreased by 3.8%.

Current and planned actions under the Pan-Canadian Framework, adopted in December 2016, will enable Canada to meet or exceed the 2030 target.

Note: the calculations for this projection are conservative in that they do not include emission reductions from measures such as investments in public transit, clean technology and carbon sequestration or potential new actions taken by federal, provincial and territorial governments between now and 2030.

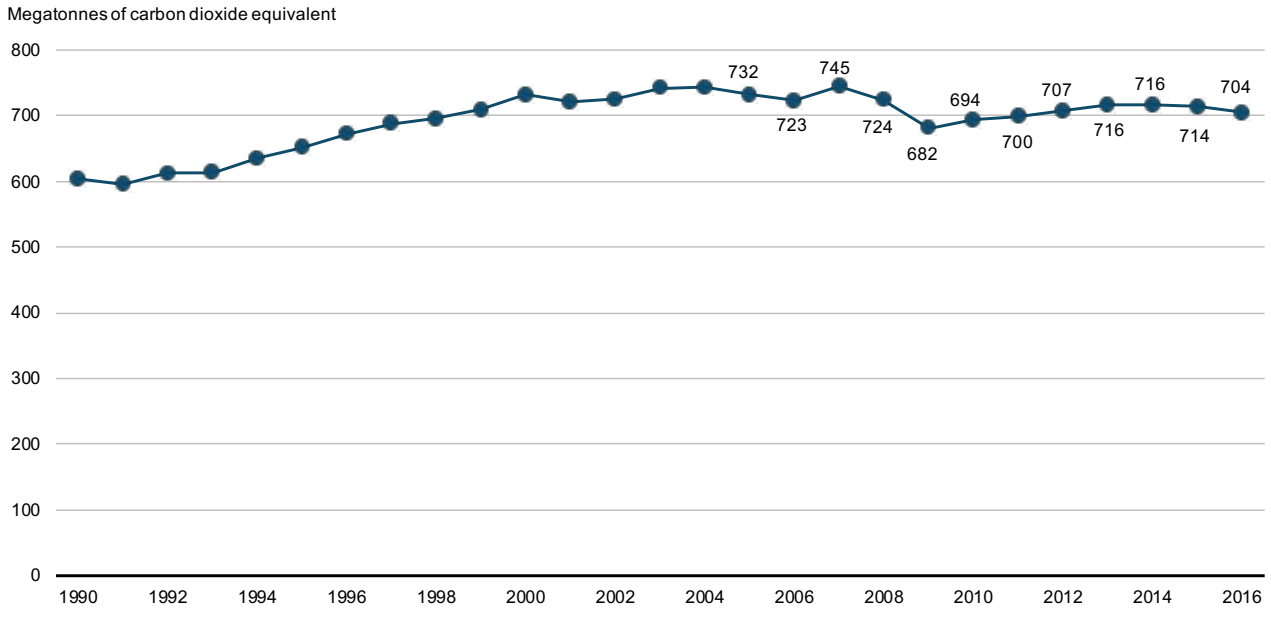
Progress is:

UNDERWAY – ON TRACK

MEETING THE TARGET

Canada's total GHG emissions in 2016 were 704 megatonnes (Mt) of carbon dioxide equivalent (CO_2 eq), 3.8% below 2005 levels. The recent decrease in emissions was primarily driven by reduced emissions from the electricity generation sector.

FIGURE 1. GREENHOUSE GAS EMISSIONS, CANADA, 1990 TO 2016



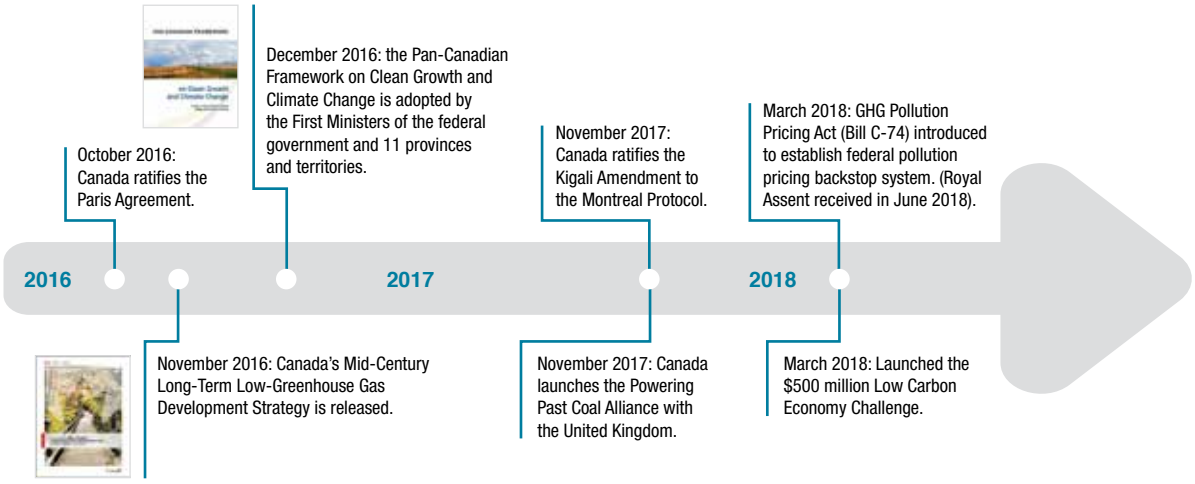
Canada's most recent GHG emissions projections demonstrate progress towards the 2030 emissions reduction target. Taking into account policies and measures, both implemented and announced, Canada's GHG emissions in 2030 are expected to be 583 Mt/CO_2 eq., that is, 232 Mt/CO_2 eq. below the previous projection (February 2016). This change in estimated emissions in 2030 is equivalent to approximately one third of Canada's 2015 emissions and is widespread across all economic sectors, reflecting the breadth and depth of the Pan-Canadian Framework.

Further progress is expected at the national level as current estimates do not include the full reductions from investments in areas such as public transit, clean technology and innovation. These projections also do not account for new policies that may be implemented by government – municipal, provincial/territorial or federal – between now and 2030.

Potential increases in stored carbon (such as carbon sequestration) in forests, soils and wetlands could also contribute to further reductions. Canada's GHG emissions projections are expected to be updated by the end of 2018 to reflect changing circumstances and assumptions regarding mitigation potential of evolving measures.

When the policies and programs within the Pan-Canadian Framework are fully implemented, the Framework will enable Canada to meet its 2030 target, and position Canada to set and achieve deeper emission reduction targets beyond 2030.

ACHIEVING THE MILESTONES



WHAT THE GOVERNMENT OF CANADA DID

Canada was among the first to sign and ratify the Paris Agreement. Subsequently, under the Pan-Canadian Framework on Clean Growth and Climate Change, federal, provincial, and territorial governments agreed to work together to reduce Canada's GHG emissions.

The Framework includes more than 50 concrete measures under 4 key pillars: pricing carbon pollution; complementary actions to reduce emissions; adaptation and climate resilience, including programs for Indigenous communities; and, clean technology, innovation and jobs. To help achieve the goals and actions, programs and policies are being developed and monitored, results measured and performance reported. The First Annual Synthesis Report on the Status of the Pan-Canadian Framework Implementation was released in December 2017.

The Framework is also supported by historic federal investments to support climate mitigation, adaptation and clean growth. This includes the Low Carbon Economy Fund and the Investing in Canada Plan which support projects aimed at reducing GHG emissions, generating clean growth, and building climate resilience through infrastructure. By investing billions of dollars in green infrastructure and public transit, smart grids, energy-efficient buildings, homes and industry and electric vehicle infrastructure, the federal government aims to mainstream innovative, low-carbon solutions.

CANADA'S MID-CENTURY STRATEGY

Canada's Mid-Century Strategy describes various pathways for solutions. As called for in the Paris Agreement, these solutions are consistent with our international goal of holding the global average temperature rise to well below 2 °C, while pursuing efforts to limit the temperature increase to 1.5 °C.

Canada's mid-century strategy looks beyond 2030 to start a conversation on the ways we can reduce emissions for a cleaner, more sustainable future by 2050. The strategy focuses on meeting climate-change objectives and highlights the growth and significant long-term investments in infrastructure that are required to support transformation to a low-carbon economy.

As part of the Framework, the federal government established the Canadian Centre for Climate Services in September 2018, and introduced new tools and climate change adaptation programs for Indigenous communities and Northerners. These included establishing standards for designing, building and maintaining roofs, foundations, and water systems in northern communities, and funding programs for supporting projects to strengthen the climate resilience of northern transportation systems.

Under the Framework, over the past 2 years a number of new regulations have been published including those for hydrofluorocarbons (HFC) in October 2017, for methane emissions in April 2018, and for heavy-duty vehicle efficiency in May 2018. Additional details on these and other Pan-Canadian Framework actions and initiatives can be found in the chapters on "Low-carbon Government", "Clean Growth", "Modern and Resilient Infrastructure" and "Clean Energy".

In autumn 2017, Canada co-founded the Powering Past Coal Alliance to help accelerate clean growth and climate protection through the rapid phase-out of traditional coal-fired electricity.

RISKS AND CHALLENGES TO MEETING THE TARGET

- Achieving our climate targets require a concerted effort from all sectors of civil society. Cooperation with the provinces and territories is also key to moving forward on Canada's climate objectives.
- Canada's geographic, demographic and economic circumstances present substantial challenges and influence its GHG emissions profile. For example, while Canada has a relatively small but rapidly growing population relative to other OECD countries, the population is dispersed across one of the world's largest and coldest countries. These factors contribute to heavier energy and transportation needs than in smaller and more densely populated countries.
- Canada experiences a wide range of climate conditions. Most of the inhabited regions have distinct seasons, with very cold winters and very warm summers. Heating and cooling needs have a great impact on energy use and GHG emissions.
- Canada's climate has been warming for more than 10 years. Northern regions are the most affected, and extreme events such as drought, forests fires, floods and severe thunderstorms are happening more frequently throughout the country.
- According to the International Monetary Fund, Canada's growth was the fastest among G7 economies in 2017 with a 3% gross domestic product growth rate in 2017 and an anticipated growth of 2.1% in 2018. While Canada's economy is primarily driven by the service sector, its manufacturing, construction, mining, oil and gas, and forestry sectors still represent about 30% of the economy. These GHG intensive sectors contribute significantly to Canada's GHG levels.

PARTNERS TAKING ACTION:
DISTRICT HEATING FOR IQALUIT'S AQUATIC CENTRE

Plans are in place in 2018 for Qulliq Energy Corporation to construct an extension of the existing District Heating System to heat Iqaluit's new Aquatic Centre. The connection to the District Heating System is a key component of its LEED (Leadership in Environment and Energy Design) certification. The project is expected to provide 70% to 85% of the heating requirements of the Aquatic Centre, and will result in financial savings for the city. It is estimated that over 157,000 litres of heating fuel will be offset annually, translating into CO_2 emission reductions of over 465 tonnes/year. This photo is of piping for the existing District Heating System provided by Crown-Indigenous Relations and Northern Affairs Canada.

CANADA IN THE WORLD

Taking action on climate change supports the United Nations 2030 Agenda for Sustainable Development and its global Sustainable Development Goals (SDGs), in particular, SDG 7 Affordable and Clean Energy, SDG 12 Responsible Consumption and Production, SDG 13 Climate Action and SDG 17 Partnerships for the Goals.

Target 7.3 – By 2030, double the global rate of improvement in energy efficiency.

Target 12.8 – By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.

Target 13.1 – Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries.

Target 13.2 – Integrate climate change measures into national policies, strategies and planning.

Target 13.3 – Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.

Target 17.16 – Enhance the global partnership for sustainable development, complemented by multi stakeholder partnerships that mobilize and share knowledge, expertise, technology and financial resources, to support the achievement of the sustainable development goals in all countries, in particular developing countries.

It also supports other international agreements and initiatives, including the Paris Agreement and the United Nations Framework Convention on Climate Change.

LOW-CARBON GOVERNMENT

Responsible Ministers: Treasury Board Secretariat with all Ministers

THE GOVERNMENT OF CANADA LEADS BY EXAMPLE BY MAKING ITS OPERATIONS LOW-CARBON.

THIS CAN BE ACHIEVED BY THE GOVERNMENT OF CANADA REDUCING GREENHOUSE GAS (GHG) EMISSIONS BY 40% BY 2030 AND 80% BY 2050 RELATIVE TO 2005 LEVELS. THE GOVERNMENT OF CANADA CAN USE ITS OPERATIONAL ACTIVITIES TO SUPPORT CANADA'S OVERALL TRANSITION TO A LOW-CARBON ECONOMY.

WHY IT'S IMPORTANT

The Government of Canada owns more than 35,000 buildings across the country, and through its operations, consumes a significant amount of energy from GHG emitting sources. In addition, the federal government manages a large fleet of more than 30,000 on-road vehicles (most relying on fossil fuels), and spends billions of dollars each year on goods and services.

This large environmental impact represents an opportunity to lead the transition to a low-carbon economy: stimulating the clean technology sector, contributing to Canada's international climate change commitments, and achieving cost savings. Buying electricity from non-GHG emitting sources is one of the steps the federal government has taken.

ACHIEVEMENTS

TARGET

Reduce GHG emissions from federal government buildings and fleets by 40% below 2005 levels by 2030, with an aspiration to achieve these reductions by 2025.

RESULT

By 2016-17, federal GHG emissions were 28% lower than in 2005-06, more than halfway to the target.

This compares to fiscal year 2014-15, when GHG emissions decreased by 19%, relative to fiscal year 2005-06.

Progress is:

UNDERWAY – ON TRACK

MEETING THE TARGET

GHG emissions from federal facilities and fleets, as seen in Figure 2, have steadily declined. Since 2005-06, federal GHG emissions have been reduced by 28%, more than halfway to the target. GHG emissions from federal facilities have been reduced by 29.4%, primarily from improvements to electricity generation, the use of cleaner fuels and increased energy efficiency, while GHG emissions from the federal fleet have reduced by 18.4% as a result of fleet rationalization and improved vehicle efficiency. The GHG emission reductions from major emitting federal departments subject to the GHG reduction target are shown in Figure 3.

NOTE: Consistent with practices in other jurisdictions, some GHG emissions are excluded from the Government of Canada's GHG emissions reduction target for safety and security reasons. Examples are emissions from military, coast guard or the Royal Canadian Mounted Police operations. These national safety and security related emissions will be tracked and publicly disclosed.

FIGURE 2. GREENHOUSE GAS EMISSIONS REPORTED

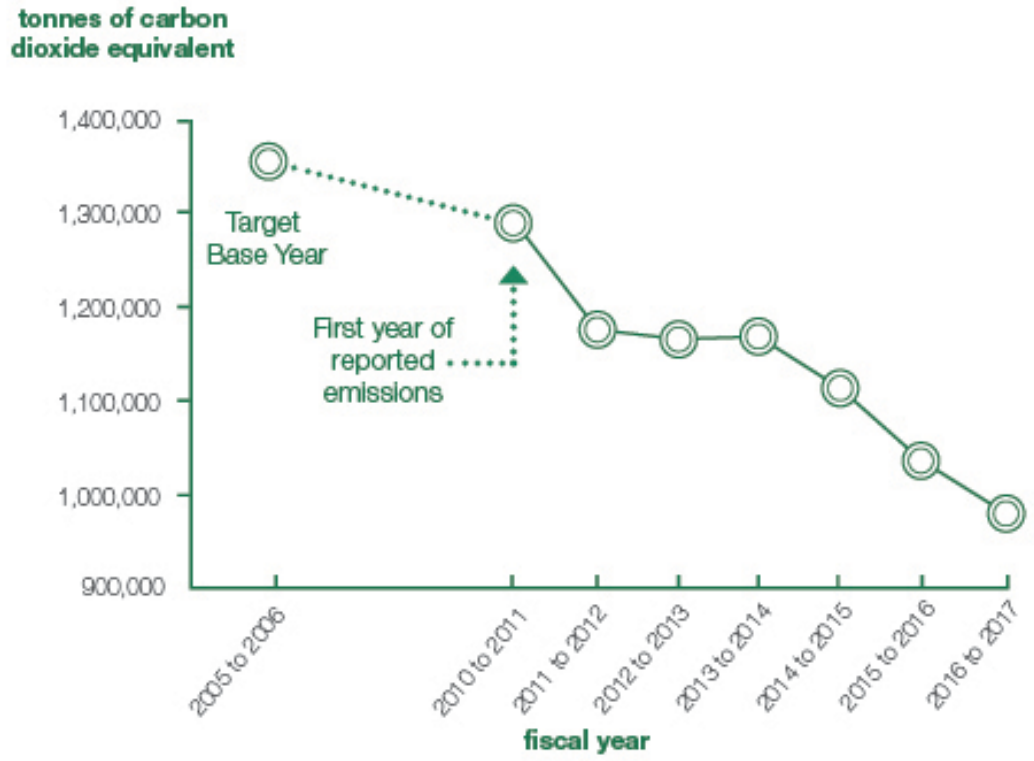
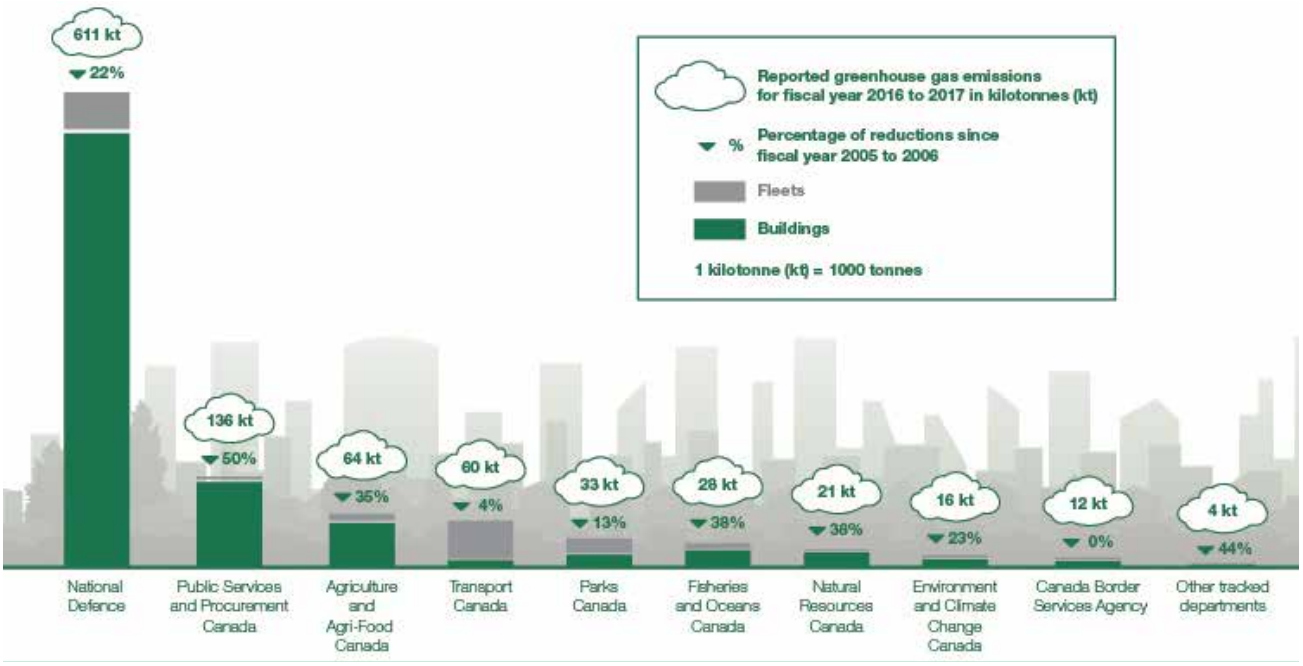
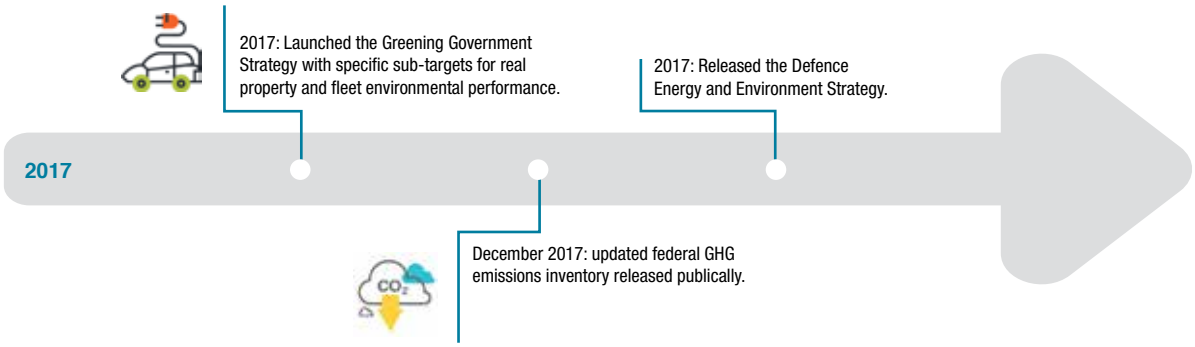


FIGURE 3. REPORTED FEDERAL GREENHOUSE GAS EMISSIONS IN 2016-17 AND REDUCTIONS SINCE 2005



ACHIEVING THE MILESTONES



WHAT THE GOVERNMENT OF CANADA DID

In November 2016, the Government of Canada established the Centre for Greening Government within the Treasury Board Secretariat to track and report on emissions, coordinate greening efforts across government, and drive results.

In December 2017, the Greening Government Strategy set an ambitious target to reduce GHG emissions from federal operations by 40% by 2030 and 80% by 2050 (from 2005 levels) and expanded greening efforts to include actions on clean energy and adaptation. Key investments have been made to green federal operations.

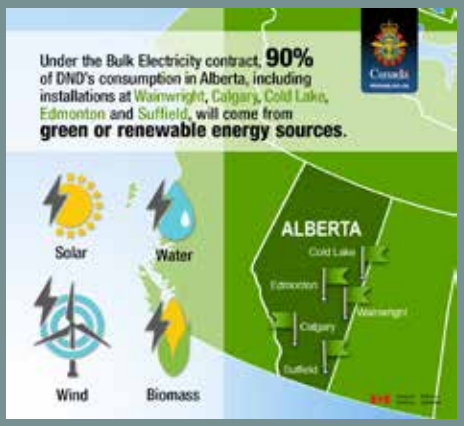
In the Pan-Canadian Framework on Clean Growth and Climate Change, federal, provincial and territorial governments committed to reducing emissions from government operations by setting ambitious targets, cutting emissions from government buildings and fleets, and scaling up clean procurement.

- More than $1 billion in new funding was provided for the Energy Services Acquisition Program to retrofit and modernize the heating and cooling plants which serve more than 80 locations in the National Capital Region, leading to significant reductions in GHG emissions.
- Over 11 years, $29.7 million has been dedicated to provide enhanced technical support and a one-stop window for federal organizations seeking information about GHG emission reduction options for their building and fleet operations.
- Innovative Solutions Canada was launched for funding early-stage research and development, late-stage prototypes and other goods and services from Canadian innovators and entrepreneurs, and to provide access to the latest, most innovative products and services.
- An initiative was announced to reduce GHG emissions from Canadian Forces Base Halifax, involving the refurbishing of the heating plant and the rehabilitation of attached buildings.
- On January 1, 2017, a 5-year agreement, with a one-year option for extension came into effect to purchase Renewable Energy Certificates (RECs) to supply government departments in Alberta with clean electricity.

- As a part of the 125 Sussex renovation project, Public Services and Procurement Canada has completed a sustainability study to improve the environmental performance of Global Affairs Canada's Lester B. Person (LBP) building. This study recommended that the LBP building renovations work towards a Leadership in Energy and Environmental Design (LEED) Gold certification, which could reduce the LBP GHG emissions by about 77%.

RENEWABLE ENERGY AT THE DEPARTMENT OF NATIONAL DEFENCE

In addition to purchasing renewable energy, Department of National Defence (DND) is identifying suitable land parcels for generating its own renewable energy sources to help reduce greenhouse gas emissions. DND is already commissioning feasibility studies for renewable energy installations that will include collaboration with provincial governments and partnerships with other organizations.



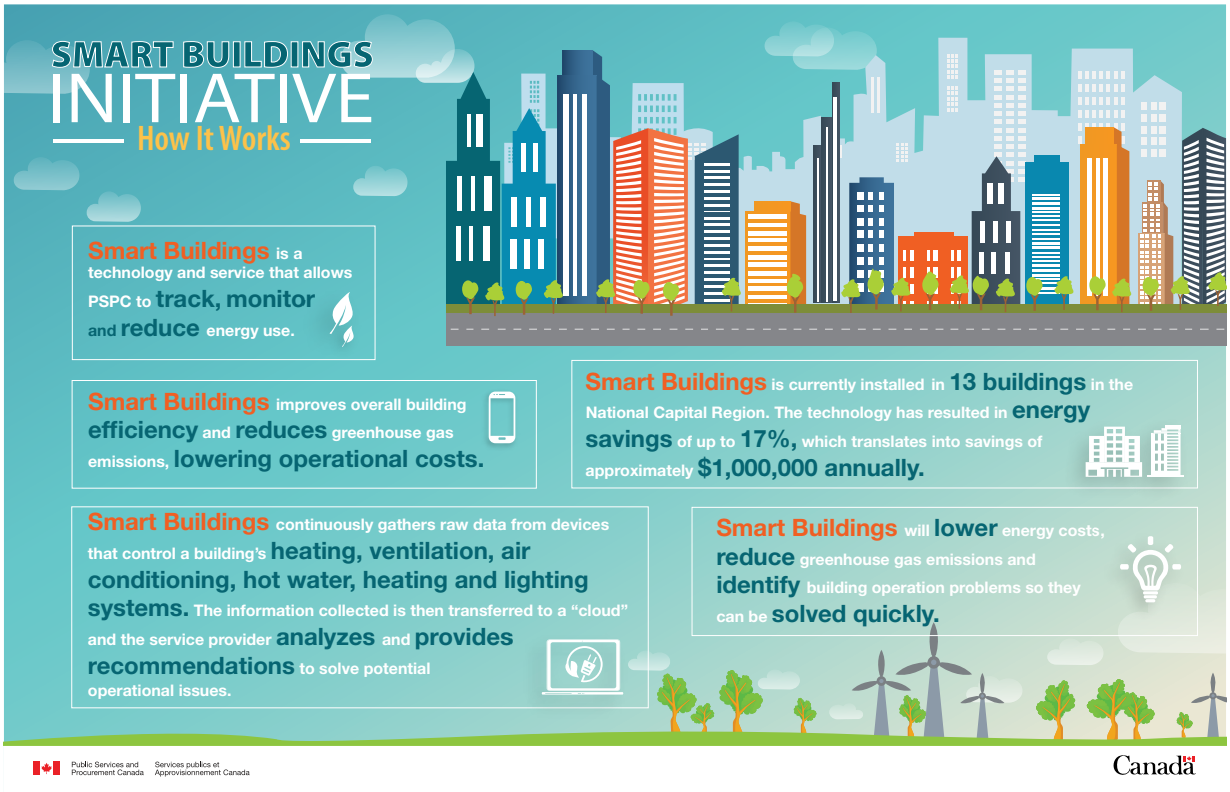
RISKS AND CHALLENGES TO MEETING THE TARGET

- Emissions reductions from real property assets typically require longer timeframes, involve more stakeholders and greater resources, especially as the government owns many aging buildings.
- Climate change also affects federal infrastructure, such as buildings, wharves, and bridges. Federal organizations have to adapt these assets to be more resilient.
- Low emission vehicles have yet to be widely available in certain vehicle classes that the government operates.

PARTNERS TAKING ACTION:

SMART BUILDING INITIATIVE

The Smart Buildings technology, currently installed in 13 buildings in the National Capital Region, has resulted in annual energy savings of up to 17%, approximately $1,000,000. This technology collects raw data from mechanical or electrical systems, analyzes it and uses the results to detect inefficiencies that can be solved right away.



CANADA IN THE WORLD

Federal actions supporting climate change also support SDG 12 Responsible Consumption and Production, and SDG 13 Climate Action.

Target 12.7 – Promote public procurement practices that are sustainable, in accordance with national policies and priorities.

Target 13.2 – Integrate climate change measures into national policies, strategies and planning.

This goal also supports Canada's commitment to other international agreements and initiatives, including the United Nations Framework Convention on Climate Change and the Paris Agreement.

CLEAN GROWTH

Responsible Ministers: Minister of Innovation, Science and Economic Development, Minister of Natural Resources

A GROWING CLEAN TECHNOLOGY INDUSTRY IN CANADA CONTRIBUTES TO CLEAN GROWTH AND THE TRANSITION TO A LOW-CARBON ECONOMY.

THIS CAN BE ACHIEVED BY INVESTING IN CANADA'S CLEAN TECHNOLOGY INDUSTRY AND PROMOTING OUR INNOVATIVE PRODUCTS AND SERVICES NATIONALLY AND INTERNATIONALLY.

WHY IT'S IMPORTANT

The global economy is moving towards a low-carbon future and this creates opportunities for Canada. In order to transition to a low-carbon, clean growth economy and greener future, Canadian clean technology users and producers need to be at the forefront of this change to both manage the changes and to realize the opportunities of these new and emerging markets.

Canada has become a global leader, ranked fourth on the 2017 Global Clean Tech Innovation Index. With its partners and strategic investments, the Government of Canada is driving innovation to enable all industries to reduce their environmental impact, access new markets, and be globally competitive. This, in turn, will create jobs while helping to meet the climate change goals.

ACHIEVEMENTS

TARGET

Implement the Mission Innovation commitment to double federal government investments in clean energy research, development and demonstration, by 2020, from 2015 levels.

RESULT

Canada continues to make investments in clean energy research, development and demonstration (RD&D) towards doubling federal investments over 5 years, with a federal investment of $438 million in the second year of the commitment.

Progress is:

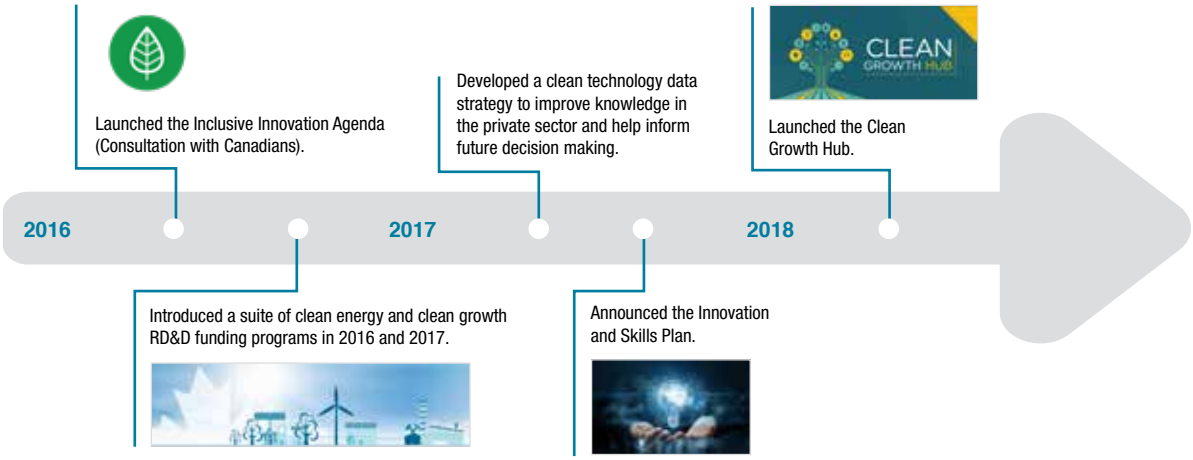
UNDERWAY – ON TRACK

MEETING THE TARGET

With the adoption of the Pan Canadian Framework on Clean Growth and Climate Change, federal, provincial, and territorial governments committed to a common vision for accelerating clean growth in Canada and abroad. They pledged funding for clean energy innovation and clean growth programs, and support for Canada's clean technology companies through the Innovation and Skills Plan and the commitment of the Regional Development Agencies (RDA) to double their collective investments in clean technology to $100 million. This commitment was announced in Budget 2016 and reinforced in 2017 in Investing in Regional Innovation and Development, the RDA plan to support the Innovation and Skills Plan. In 2015-16, the Government of Canada increased clean energy research, development and deployment funding 24% over the previous year.

The Government of Canada's 6 regional economic development agencies are important drivers of clean technology investment in Canada (Western Economic Diversification Canada, Federal Economic Development Agency for Southern Ontario, Federal Economic Development Initiative for Northern Ontario, Canada Economic Development for Quebec Regions, Atlantic Canada Opportunities Agency, and Canadian Northern Economic Development Agency). Beginning with the release of Budget 2016, these agencies committed to investment in clean technology development and commercialization.

ACHIEVING THE MILESTONES



WHAT THE GOVERNMENT OF CANADA DID

Through 3 consecutive federal budgets, the Government of Canada has made substantial investments in initiatives to support clean technology, clean energy and clean growth. These commitments include:

- $2.3 billion in 2017 for clean technology and clean energy research, development, demonstration, adoption, commercialization and use;
- $1.26 billion in Budget 2017 for the Strategic Innovation Fund;
- $4 billion in 2018 in Canada's research and science infrastructure, much of which helps drive innovation towards a clean growth economy.

These investments support Canada's Mission Innovation pledge to double federal funding for clean energy research, development and demonstrations from $387 million in 2014-15 to $775 million by 2020 to help accelerate clean energy technology innovation.

As part of the Budget 2017, the Government of Canada invested $14.5 million to develop a clean technology data strategy that will foster innovation, improve knowledge in the private sector and stakeholder communities, and inform government decision making.

In December 2017, Statistics Canada released the first round of data showing how clean technologies and environmental goods and services contribute to the Canadian economy.

- Environmental and clean technology accounted for 1.4% ($26.7 billion) of Canada's gross domestic product in 2016. This sector also accounted for an estimated 178,000 jobs or just under 1% of jobs in Canada in 2016.
- Clean technology exports totaled $7.8 billion in 2016, growing 43% from 2007.

Canada is a founding member of Mission Innovation, a global initiative of 23 countries and the European Union to dramatically accelerate global clean energy innovation. Countries have committed to doubling their governments' clean energy research and development investments over 5 years, while encouraging greater levels of private-sector investment. Canada plays a leadership role as a member of the Steering Committee, assuming the role of Chair in 2018. It participates in 8 innovation challenges including co-leading the Sustainable Biofuels Challenge and the Clean Energy Materials Challenge, and collaborating with private sector investors such as the Breakthrough Energy Coalition.

The Clean Growth Hub is the Government of Canada's focal point for its support of clean technology companies, projects, programs and results tracking. The hub was launched in January 2018 and, as of July 2018, worked with more than 500 clean technology clients helping them to navigate federal programs and identify funds most relevant to their needs.

By funding all stages of the development process, from research to the market-ready stage, the federal commitment of $2.3 billion between 2017 and 2022 will support companies and projects of all sizes, with $1.8 billion allocated to demonstration projects, commercialization of promising ideas and finally, scale-up of existing projects.

CANADIAN BATTERIES ACROSS THE WORLD

Surette Battery has been operating in Nova Scotia since 1935. In the 2000s, the company became an early player in the photovoltaic energy storage field. It has now installed, with the help of the Government of Canada, more than 200,000 systems for customers in Canada, the United States, and across Europe and Africa. It is the only independent Canadian battery manufacturer, and is moving forward, prepared to innovate to meet the demands of a rapidly changing market.

In late 2017 and early 2018, the federal government successfully launched initiatives to support clean technology, some of which are highlighted.

While more federal programs are still in the process of receiving and reviewing projects, 36 projects and 28 companies have already received funding from Sustainable Development Technology Canada (SDTC), Business Development Bank of Canada (BDC) and Fisheries and Oceans Canada between January and May 2018.

The Government of Canada is supporting clean growth in different areas of the economy through Mission Innovation and a range of other funding initiatives.

PRIVATE SECTOR CLEAN TECHNOLOGY DEVELOPMENT

Clean technology firms have had access to nearly $1.4 billion in new financing with the BDC and Export Development Canada for growth and investment in assets, inventory, talent, and market expansion.

CLEAN ENERGY INNOVATION

Since 2016, the Government of Canada intensified its efforts to accelerate energy innovation research and development.

The Energy Innovation Program is investing $49.2 million over 3 years (2016-19) to external recipients and federal researchers to develop emerging technology and demonstrate promising near-commercial technologies to reduce Canada's carbon impact and support the development of research, codes and standards that will facilitate new technology adoption.

Projects focus on advancing technologies with the potential to reduce GHG emissions in Canada's 5 largest emitting sectors: oil and gas, electricity generation, transportation, buildings and heavy industry. To further its commitment, starting in 2018, the Government of Canada will provide $52.9 million per year of ongoing funding, and an additional $211.6 million between 2018 and 2023.

The Program of Energy Research and Development provides funding to federal departments and agencies for clean energy research and development projects that: reduce the risks inherent in the early stages of the innovation cycle; encourage private sector investment; and inform the development of Canadian codes, standards and policies.

HARVESTING WIND ENERGY IN THE ARCTIC

Tugliq Energy Co. is reaching new heights in harvesting wind energy at industrial scale in the Arctic thanks to an innovative foundation structure that adapts to the permafrost degradation over the life of the turbine and minimizes the environmental footprint. The Government of Canada provided $7.8 million of the $18.9 million to the project Glencore RAGLAN Mine Renewable Electricity Smart-Grid Pilot Demonstration. Tugliq Energy's wind urbine has successfully operated for 3 consecutive years, delivering 30.2 Gigawatt hour of renewable energy to the Mine, abating 6.2 million litres of diesel.

CLEAN OIL AND GAS

Since 2016, the Oil and Gas Clean Technology Program has supported 9 industry-led clean technology demonstration projects, with $49.4 million of federal funding, and an additional $119.2 million from project partners. Projects will help reduce Canada's carbon impact and make fossil fuel production and use more environmentally responsible.

CLEAN TECHNOLOGY

The Clean Technology Stream of the Impact Canada Initiative provides $75 million over 4 years from 2017-18 to 2020-21 to support innovative, collaborative approaches (such as prizes, challenges, and micro-grants). These will target specific barriers in clean technology, and drive transformative, next-generation solutions. The Women in CleanTech challenge was the first to be launched in May 2018 and will accelerate the development of women-led clean technology enterprises. Other initiatives will focus on persistent problem areas such as reducing reliance on diesel fuel for heat and power in remote and northern communities.

CLEAN GROWTH

The federal government is investing $155 million over 4 years (2017 to 2021) to support industry-led clean technologies in the energy, mining and forestry sectors. With financial or in-kind support from the provinces and territories, the Clean Growth Program encourages new partnerships between natural resources companies, clean technology producers, and end-users to bring these technologies to the stage of commercial readiness. This first of its kind program coordinates efforts and focuses clean technology investments in areas that will most effectively help Canada meet its climate change goals, create economic opportunities, and increase the capacity of Canadian companies to compete in the global market.

CLEAN INFRASTRUCTURE

Since 2017, Green Infrastructure programs have accelerated the demonstration, deployment and market entry of next generation clean energy infrastructure, such as Electric Vehicle and Alternative Fuel Infrastructure Deployment Initiative, Smart Grids, Clean Energy for Remote and Rural Communities, Energy Efficient Building, and Emerging Renewable Power. These next-generation clean energy infrastructure and technologies will help advance Canada's efforts to build a clean economy, create jobs and help Canada reach its climate change goals.

PRIVATE SECTOR R&D

Since 2017, the $1.26 billion Strategic Innovation Fund has supported company-led research and development and commercialization projects, firm expansion and growth, investment attraction and collaborative technology demonstration projects.

PRE-COMMERCIAL DEVELOPMENT AND DEMONSTRATION

In 2017, the Sustainable Development Technology Canada – SD Tech Fund received $400 million. The fund supports projects that are at the pre-commercial stage and have the potential to generate significant and quantifiable environmental and economic benefits in one or more of the following areas: climate change, clean air, clean water and clean soil. The Government of Canada has allocated $965 million to the SD Tech Fund since the programme's initial conception in 2001.

SUSTAINABLE DEVELOPMENT TECHNOLOGY CANADA
TECHNOLOGIES DU DÉVELOPPEMENT DURABLE CANADA

RISKS AND CHALLENGES TO MEETING THE TARGET

- Canada has much of what it takes to excel in clean technology. However, some key challenges are:
  - constrained access to financing;
  - ability of Canadian clean tech companies to scale-up;
  - fierce international competition and trade tariffs;
  - need for a highly trained and educated workforce, including attracting youth;
  - under-representation of women and other groups; and
  - the need for more RD&D and collaboration.
- Leveraging Canada's strengths in natural resources to drive growth in the clean technology sector is critical to the transition to a clean growth economy. While Canada's energy, mining and forestry sectors are prominent developers and adopters of clean technology, market barriers, such as capital costs and competition with pre-existing higher carbon technologies, are preventing synergies across these sectors.
- The clean technology sector is rapidly growing. However, the rate of development and adoption of clean technologies across the Canadian economy must increase to ensure that Canada's market share of the clean technology sector does not decline and affect Canada's competitiveness.

PARTNERS TAKING ACTION:

BUILD IN CANADA INNOVATION PROGRAM

The Build in Canada Innovation Program (BCIP) helps companies bridge the pre-commercialization gap by supporting them in testing late stage innovative goods and services within the federal government, before taking them to market. For example, RidgeBlade units designed to harness solar and wind power are being installed on 2 large buildings at the Canadian Forces Base in Trenton. The project consists of 294 solar panels, 18 wind generators, and is expected to produce 157,000 kWh of electricity each year; the emission reduction equivalent is taking 780 cars off the road, or planting 95,250 trees.

Between 2010 and 2017, the BCIP awarded more than $100 million to companies. Successful products supported by the program include an electric snowmobile, GHG emission satellite-based tracking system, a permafrost thaw detector, and a new river turbine.

CANADA IN THE WORLD

Investing in clean technology research, development and demonstration supports SDG 9 Industry, Innovation and Infrastructure and SDG 12 Responsible Consumption and Production.

Target 9.5 – Enhance scientific research, upgrade the technological capabilities of industrial sectors in all countries, in particular developing countries, including, by 2030, encouraging innovation and substantially increasing the number of research and development workers per 1 million people and public and private research and development spending.

Target 12.2 – By 2030, achieve the sustainable management and efficient use of natural resources.

The goal also supports Canada's contribution to Mission Innovation.

MODERN AND RESILIENT INFRASTRUCTURE

Responsible Minister: Minister of Infrastructure and Communities

MODERN, SUSTAINABLE, AND RESILIENT INFRASTRUCTURE SUPPORTS CLEAN ECONOMIC GROWTH AND SOCIAL INCLUSION.

THIS IS BEING ACHIEVED THROUGH PROJECTS TO UPGRADE WATER AND WASTEWATER TREATMENT, CLEAN ENERGY GENERATION, AND FLOOD MITIGATION SYSTEMS. THESE PROJECTS ARE DESIGNED TO SAFEGUARD THE HEALTH AND WELL-BEING OF RESIDENTS, PROTECT WATERWAYS AND PRESERVE LOCAL ECOSYSTEMS.

WHY IT'S IMPORTANT

Across Canada, it is an on-going challenge to maintain and add to Canada's aging infrastructure. Increasingly, Canadian communities also need to put in place measures to reduce the impact of natural disasters such as floods, wildfires, and storms. These types of climate-related events damage community infrastructure and hinder economic and social activity. Major repairs can take months or years to complete.

"Green" infrastructure is designed to protect the natural environment and human health, resist the effects of natural disasters, while providing the economic, environmental and social benefits of conventional approaches. It includes, for example, infrastructure for:

- clean energy, to decrease greenhouse gas emissions (GHGs) and air pollution;
- modern water and wastewater facilities to ensure that Canadians have access to clean drinking water, healthy lakes, rivers and oceans; and
- critical flood mitigation systems to help protect communities from future natural disasters and reduce the impacts of climate change.

ACHIEVEMENTS

TARGET

By the end of 2025-26, invest $20 billion in funding for green infrastructure initiatives that reduce GHG emissions and improve climate resilience and environmental quality.

RESULT

By the end of fiscal year 2017-18, the Government of Canada had approved $3.2 billion in funding for green infrastructure initiatives.

Progress is:

UNDERWAY – ON TRACK

MEETING THE TARGET

The target for modern and resilient infrastructure is about investments as well as funding to provinces, territories and municipalities for green infrastructure initiatives. These investments are being rolled out in 2 phases under the Investing in Canada plan.

As of May 2018, $3.2 billion was approved for Phase 1 to support thousands of green infrastructure initiatives. An interactive map (see side-bar) highlights these projects.

During 2018-19, Phase 2 funding, announced in Budget 2017, builds on the progress achieved in Phase 1. Priorities include helping municipalities increase green space and tree canopies and building better storm water drainage systems. This additional funding also supports communities as they develop and implement new land use and watershed management plans to reduce the destructive impacts of fire, floods and drought. A “climate lens” is part of the project review process to ensure that GHG emissions and climate risks are duly considered before certain important capital projects receive funding.

ACHIEVING THE MILESTONES

2016

For Phase 1 of the Investing in Canada Plan, $5 billion in new green infrastructure funding was made available through Budget 2016 for municipalities, Indigenous communities, provinces and territories.

2017

A $40-million 5-year research program at the National Research Council of Canada and a $11-million program at the Standards Council of Canada are well underway to integrate climate resiliency into building and infrastructure project design, standards, and building codes.

2018

Green funding under Phase 2 of the Investing in Canada plan includes $16.9 billion available through programs and $5 billion through the Canada Infrastructure Bank.

WHAT THE GOVERNMENT OF CANADA DID

To improve the evidence base, Infrastructure Canada is working with Statistics Canada on Canada's Core Public Infrastructure (CCPI) survey. The survey will establish a comprehensive baseline of infrastructure data that will provide Canadians with information on the stock, condition, performance, and asset management strategies of core public infrastructure assets owned or leased by provinces, territories and municipalities. Data for reference year 2016 will be released in stages, beginning in summer 2018. A summary report will be published in late fall 2018. Infrastructure Canada and Statistics Canada are working on a data strategy to produce a subset of CCPI data derived from survey and administrative data every 2 years.

Through investments in Green Infrastructure Programs, such as Electric Vehicle and Alternative Fuel Infrastructure ($120 million from 2018 to 2022), and Energy Efficient Buildings ($181.8 million from 2018 to 2026), the development and availability of next-generation clean energy infrastructure is being accelerated. This is needed to reduce GHG emissions from transportation and the heating and cooling of buildings.

Phase 1 included a $3.8 billion investment to help municipalities and on-reserve communities build or enhance their drinking water, wastewater and storm water systems. As of April 2018, funding has been approved for 2769 water quality-related initiatives across Canada, including 420 water and wastewater projects in 297 First Nation communities. (See Clean Drinking Water chapter for more information.) This funding will improve drinking water reliability and limit the discharge of raw or insufficiently treated sewage into rivers, lakes and oceans. The Government of Canada also contributed $400,000 to the Canadian Water Network to support an expert panel review of existing contaminants from wastewater and technologies that could be used to mitigate the effects.

Through the Municipalities for Climate Innovation Program, a $75 million initiative, the Government of Canada is working with the Federation of Canadian Municipalities to increase municipal capacity to invest in low carbon and climate resilient infrastructure.

Phase 2 also includes the Disaster Mitigation and Adaptation Fund, a new $2 billion program for infrastructure projects, launched in May 2018 to help communities better manage the risks triggered by natural hazards. Funding for green infrastructure projects is also available through Infrastructure Canada's Integrated Bilateral Agreements ($9.2 billion) and the Canada Infrastructure Bank ($5 billion).

Phase 1 of the Electric Vehicle and Alternative Fuel Infrastructure Initiative, with $62.5 million over 2 years, supports the construction of 102 electric vehicle fast-chargers, 7 natural gas refueling stations, 3 hydrogen refueling stations, and the demonstration of more than 200 next-generation electric vehicle charging stations. The program exceeded its target when the first electric vehicle charging station was opened on May 25, 2017.

RISKS AND CHALLENGES TO MEETING THE TARGET

- Canadian buildings and infrastructure will continue to face risks from floods, droughts, heat waves and high winds. This ongoing challenge will require the adaptation of buildings and infrastructure to withstand future natural disasters and the impacts of climate change.
- In the North, and on the Pacific and Atlantic coasts, climate change is expected to place additional stress on infrastructure due to thawing of permafrost, reductions in sea ice, and rising sea levels.
- Sound decisions are informed by strong evidence-based research and data; however, many investment decisions still tend to favour "tried-and-true" approaches. Building support for innovative approaches through research and best-practices from around the world is critical to successfully developing and building infrastructure to meet future climate challenges.
- In addition, the time between the construction and completion of a project and the availability of data about its impacts on services and the environment can be significant. As a result, it often takes years to adjust conventional approaches and put innovative methods into practice.
- The National Assessment of First Nations Water and Wastewater Systems – 2009-11 identified the need for additional investments to maintain and operate infrastructure in Indigenous communities. While some progress has been made, gaps remain. (See Clean Drinking Water chapter for more information.)

PARTNERS TAKING ACTION: ADVANCING GREEN INFRASTRUCTURE STANDARDS BY BUILDING THE TALLEST HYBRID WOOD BUILDING IN THE WORLD

As of November 2017, the Brock Commons Tallwood House of the University of British Columbia in Vancouver is the tallest contemporary hybrid wood building in the world. The structure is an 18-storey hybrid mass timber student residence, which was funded under the 2013 Tall Wood Building Demonstration initiative. Building with wood offers many benefits: wood stores more carbon than traditional materials, requires less energy to manufacture, conserves energy in heating and cooling, and is more affordable and lightweight than other construction materials.

Building on the success of this first initiative, a new program, the Green Construction through Wood (GCWood) Program, was launched. This program encourages greater use of wood in construction projects in Canada, and features demonstrations of other tall wood buildings.

PARTNERS TAKING ACTION:

EXPANSION OF FLEET OF CLEAN TRANSIT BUSES

In Toronto, Ontario, the Toronto Transit Commission (TTC) is using more than $309 million in federal funding to renew and revitalize its fleet through the purchase of 983 new clean-diesel and hybrid-electric buses. A further $65 million in federal funding is helping to pilot the use of 60 battery-electric buses. The new accessible buses will help the TTC achieve the City of Toronto's greenhouse gas (GHG) reduction target of 80% by 2050. Starting in 2019, the TTC will see the first of 60 all-electric, zero-emission vehicles in service. By 2025, the TTC will only purchase zero-emission buses, and by 2040, the entire bus fleet is scheduled to be zero emission.

A combination of hybrid-electric, battery-electric and clean-diesel buses will be used to renew and expand the fleet. These cutting edge buses (60 in all) will reduce GHG emissions by 8,900 tonnes per year. The rehabilitation of the existing fleet is also underway, while a preventative maintenance program will keep the entire TTC bus fleet running efficiently and reliably.

PARTNERS TAKING ACTION:

ADDÉNERGIE'S SERVICE STATIONS OF THE FUTURE

Canada's AddÉnergie is contributing to the growth of Canada's electric vehicle charging infrastructure, by developing new and innovative technologies like fast-charging stations, curbside stations for city streets and residential chargers. The company has deployed over 4500 charging stations and 3500 residential chargers, all connected to an innovative central management system. AddÉnergie research and development, demonstration and commercialization efforts are being supported by Canada Economic Development for Quebec Regions and by Natural Resources Canada's Electric Vehicle Infrastructure Program.

CANADA IN THE WORLD

Ensuring Canada's infrastructure is modern and resilient supports the 2030 Agenda's Sustainable Development Goal (SDG) 9 Industry, Innovation and Infrastructure.

Target 9.4 – By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.

CLEAN ENERGY

Responsible Minister: Minister of Natural Resources

ALL CANADIANS HAVE ACCESS TO AFFORDABLE, RELIABLE AND SUSTAINABLE ENERGY.

PROGRESS CAN BE MADE THROUGH ACCELERATING THE DEVELOPMENT AND ADOPTION OF RENEWABLE ENERGY AND OTHER CLEAN ENERGY TECHNOLOGIES WHILE REDUCING DEMAND FOR ENERGY BY USING IT MORE EFFICIENTLY.

WHY IT'S IMPORTANT

A cleaner energy system helps reduce Canada's greenhouse gas (GHG) emissions and provides benefits such as improved human and ecosystem health, more resilient infrastructure and new jobs for Canadians across the country.

Use of cleaner energy contributes to international efforts to limit global average temperature rise to below 2 degrees Celsius, thus decreasing the global risks of severe weather events, rising sea levels, and adverse impacts on land and species.

ACHIEVEMENTS

TARGET	**By 2019, there is a favourable 5-year trend in renewable electricity generation capacity compared to overall electricity sources from a 2014 level of 64.4%.**	Progress is: **UNDERWAY – ON TRACK**
RESULT	In 2016, renewable electricity generation accounted for 66% of Canada's overall electricity generation an increase from the 2014 starting point.	
TARGET	**By 2030, 90% and in the long term, 100% of Canada's electricity is generated from renewable and non-emitting sources.**	Progress is: **UNDERWAY – ON TRACK**
RESULT	In 2016, nearly 81% of Canada's electricity was generated from renewable sources – 66% from renewable energy and 15% from other non-GHG emitting sources (nuclear).	
TARGET	**By 2025, contribute to the North American goal of 50% clean power generation.**	Progress is: **UNDERWAY – ON TRACK**
RESULT	In 2016, nearly 40% of electricity generation in North America (Canada, Mexico and the United States) came from clean power sources.	

MEETING THE TARGETS

To monitor progress, the federal government tracks electricity generation from renewable sources such as solar, tidal, biomass, wind, and hydroelectricity, as well as from non-GHG emitting sources such as nuclear energy.

Federal and provincial governments made progress in providing more clean energy alternatives to Canadians. Between 2014 and 2016, the share of electricity produced from renewable and non-GHG emitting sources increased by 2% to reach 81% of the total electricity produced in Canada. This 81% share was the combination of 66% from renewable sources and 14.7% from nuclear sources.

The total share of electricity produced from non-GHG emitting sources was higher than in any other G7 country (Canada, France, United States, United Kingdom, Germany, Japan and Italy.)

The percentage of clean electricity production in North America increased from 37% in 2013 to about 40% in 2016. Canada exported 11.3% of its total clean electricity to the United States accounting for 2% of the energy consumed by the United States.

TABLE 1. ENERGY GENERATION IN CANADA BY SOURCE IN GWH AND % OF TOTAL GENERATION

	2014	2015	2016
Coal	61,611	60,906	58,041
	9.6%	9.5%	9.0%
Natural gas	57,326	58,251	59,764
	9.0%	9.1%	9.2%
Petroleum	7,237	6,966	6,757
	1.1%	1.1%	1.0%
Biomass	9,107	9,553	11,284
	1.4%	1.5%	1.7%
Hydro	378,786	378,508	383,374
	59.2%	59.3%	59.1%
Nuclear	99,456	96,046	95,418
	15.5%	15.0%	14.7%
Wind	22,315	25,163	30,462
	3.5%	3.9%	4.7%
Solar & Tidal	1,754	2,879	3,049
	0.3%	0.5%	0.5%
Other *[Electricity from thermal generation that cannot be classified as generation from petroleum, natural gas, coal, nuclear or biomass.]*	2,309	172	267
	0.4%	0.03%	0.04%
Total	**639,900**	**638,443**	**648,415**
Total Renewable [Hydro, biomass, wind, solar & tidal]	**64.4%**	**65.2%**	**66.0%**
Non-Emitting Sources [Hydro, nuclear, biomass, wind solar & tidal]	**79.9%**	**80.2%**	**80.7%**

ACHIEVING THE MILESTONES

Federal, provincial and territorial (FPT) Energy Ministers are working together on several initiatives.

2016

FPT Energy Ministers are taking actions to reduce GHG emissions and to enable sustainable economic growth as agreed to in the Pan-Canadian Framework on Clean Growth and Climate Change (2016). Transitioning to a low carbon future means using clean energy to power our homes, workplaces, vehicles, and industries, and using energy more efficiently.

Canada joined the **Clean Energy, Education and Empowerment Initiative** under the Clean Energy Ministerial.

Canada signed the **North American Climate, Clean Energy, and Environment Partnership** with the United States and Mexico.

2017

Through the **Energy Innovation Program** (2016-2019), Canada is investing to support the development of new technologies that will produce and use energy in clean and more efficient ways.

Federal, provincial and territorial Energy Ministers are taking joint action under the **Canadian Energy Strategy** on shared goals to promote energy efficiency, develop new energy technology and innovations, and identify priority energy infrastructure and advance international energy collaboration.

The First Annual Synthesis Report on the Pan-Canadian Framework on Clean Growth and Climate Change was released in 2017 and covers the first year of progress made under the framework.

2018

Programs Launched

- Emerging Renewables Program
- Clean Energy for Rural and Remote Communities Program
- Smart Grids Program
- Clean Growth Program
- Energy Efficient Buildings Research and Development Program

Phase I Deployment of the **Electric Vehicle and Alternative Fuel Deployment Initiative** program will lead to the installation of 102 EV chargers, four natural gas and one hydrogen refueling stations by summer 2018.

Canada launched the **Generation Energy** dialogue, a ground-breaking conversation with more than 380,000 Canadians and international experts. Over six months they shared their vision of how Canada could meet climate goals, create jobs and keep energy affordable.

The **Generation Energy Council's report** articulated a vision of Canada' energy transition and outlined actions that Canadians could take over the next generation to build a low carbon future.

Canada hosted the preparatory sessions for the **2018 Clean Energy Ministerial and Mission Innovation** meetings.

2019

As part of the **Regional Electricity Cooperation and Strategic Infrastructure Initiative**, two working groups were established with provincial energy ministries in Western and Eastern Canada to study the most promising electricity infrastructure projects that can significantly reduce GHG emissions. The study will release results in 2018.

WHAT THE GOVERNMENT OF CANADA DID

INVESTMENTS IN CLEAN ENERGY TECHNOLOGIES

More than $800 million (over 8 years) has been invested in developing, deploying and demonstrating clean energy infrastructure under the Green Infrastructure Program.

The program is on track to deliver on the commitments of the Pan-Canadian Framework on Clean Growth and Climate Change by:

- deploying integrated grid systems and demonstrating promising near-commercial Smart Grids ($100 million over 4 years);
- supporting projects to expand the portfolio of commercially viable Emerging Renewable Power ($200 million over 5 years);
- reducing reliance on diesel in Canada's rural and remote communities and industrial sites ($220 million over 6 years).

For example, the Northern Responsible Energy Approach for Community Heat and Electricity program, also called the Northern REACHE program, funds renewable energy and energy efficiency projects, and related capacity building and planning ($53.5 million over 10 years, starting in 2018-19).

The best energy, however, is the energy that is not used. In Canada, the energy used to power, heat, and cool buildings and run appliances accounts for 17% of the country's GHG emissions. Canada is currently improving its energy efficiency by about 1% every year and making significant investments, such as in developing model building and retrofit codes, implementing a national approach to mandatory energy labelling and disclosure, funding demonstration projects, and improving the energy performance of federal buildings.

Natural Resources Canada has published draft amendments to the *Energy Efficiency Regulations* to update or introduce new standards for 17 product categories. This should bring $4.5 billion in net energy and environmental benefits to Canadians while reducing GHG emissions by 1.5 Mt in 2030.

Each province and territory is responding in its own way to the urgency of climate change and the opportunity offered by clean growth. For example, British Columbia and Manitoba reduced their total generating capacity in 2016 by retiring thermal generation facilities. With these changes, both provinces moved closer to having fully renewable electric generation capacities. Also, wind generation has added more capacity than any other renewable source in Alberta. Since 2005, wind energy's share of total generation increased from 1.1% to 6.9%.

GENERATION ENERGY

Over 2017-18, the Government of Canada hosted the Generation Energy dialogue, a ground-breaking national dialogue with more than 380,000 Canadians and international experts. Over 6 months, Indigenous people, experts, academia, industry, stakeholders and the public shared their visions of how Canada could meet its climate goals, create jobs and keep energy affordable.

THE GENERATION ENERGY COUNCIL

The Generation Energy Council, announced in December 2017, brought together a diverse range of perspectives and expertise to envision Canada's low-carbon energy future. The Council built on what was heard through the Generation Energy dialogue by outlining an inclusive vision of Canada's energy future, and identifying 4 pathways towards a low-carbon economy: energy efficiency, cleaner power, renewable fuels, and cleaner oil and gas. In June 2018, the Generation Energy Council released its report articulating a vision of Canada's energy transition and outlining actions that Canadians could take over the next generation to build a low carbon future.

CLEAN ENERGY MINISTERIAL

The Clean Energy Ministerial (CEM) is a high-level global forum established to advance clean energy technology, share lessons learned and best practices, and encourage the transition to a global clean energy economy. Canada actively leads and participates in several CEM initiatives:

- The Clean Energy, Education and Empowerment Initiative;
- The Electrical Vehicle Initiative and EV30@30 Campaign; and
- The Energy Management Working Group and ISO50001 Campaign Canada.

In addition, Canada is active in initiatives that promote:

- energy efficient appliances;
- the role of buildings in global climate change plans;
- flexible design of power systems;
- accelerated development and deployment of smarter electric grids; and
- deployment of low-carbon technologies and no-cost policy assistance through a global network.

MISSION INNOVATION

Canada is part of Mission Innovation, a global initiative of countries working together to accelerate clean energy innovation. (See also Clean Growth chapter.) Canada will host the next Clean Energy Ministerial and Mission Innovation Ministerial in Vancouver in 2019.

NORTH AMERICA CLIMATE, CLEAN ENERGY AND ENVIRONMENT PARTNERSHIP

Canada signed the North America Climate, Clean Energy, and Environment Partnership with the United States and Mexico in June 2016. This trilateral partnership focuses on:

- advancing clean energy, including renewables, and integration of energy resources;
- improving energy efficiency;
- accelerating clean energy innovation; and
- strengthening the reliability, resilience and security of the North American electricity grid.

Eighteen (18) collaborative projects were launched in 2016-17 to advance the goals of the Partnership with 12 of these projects now complete. The remaining projects are ongoing and will continue to strengthen energy relationships within North America.

SMALL MODULAR REACTORS (SMRs)

Canada is also exploring the potential for SMRs to provide safe, reliable, and clean energy in the future. SMRs are a type of nuclear fission reactor that operate at a smaller scale than current nuclear power plants. These have the potential to reduce emissions in a variety of applications, such as on-grid power generation, on- and off-grid combined heat and power for heavy industry and resource extraction, and off-grid power and district heating for remote communities.

In order to guide important decisions on this emerging technology, Canada has initiated a "roadmapping" process with provinces, territories, power utilities, and other essential enabling partners, to explore the on- and off-grid applications for SMRs. This roadmap is expected to be complete by fall 2018.

RISKS AND CHALLENGES TO MEETING THE TARGETS

A transition to cleaner energy poses challenges for Canada.

- Overcoming barriers to using alternative sources of energy. There is a need to develop, demonstrate and deploy technologies that better integrate variable renewable energy sources in electricity systems, such as wind and solar, to reduce, for example, the technical challenges of maintaining the balance between electricity load and generation at all times of the day.
- Meeting increasing demands while reducing GHGs. Electrification in other sectors of the economy, such as transportation, will require sustained investment in electricity generation, transmission and distribution assets.
- Need for more investment in clean energy. As of 2018, Canadian private investment in clean energy has decreased significantly from 2012. With variable renewables (such as wind and solar) being the fastest growing segment in electricity production, there is an opportunity to encourage private and public investments in activities that a firm undertakes (manufacturing process, marketing) to increase the value of its products and/or services in technology development for fuel supply, generation, storage and distribution. These opportunities are key to moving towards a low-carbon energy future.

- Improving energy interconnections. Electricity interties are transmission lines that connect separate electric grids and enable the trade of electricity between jurisdictions or regions. Some provinces, such as Quebec and Ontario, can transfer very large volumes of electricity in both directions, north-south and east-west. Other jurisdictions have limited intertie capacity. A more interconnected electricity transmission system would enable increased generation and transmission of renewable electricity across Canada.
- Ensuring a smooth transition as Canada reduces its reliance on coal. In 2016, 9% of Canada's electricity was generated by coal-fired power plants, the highest emitting sources of GHGs. An accelerated phase-out of coal power has implications for workers and communities supported by the coal industry.

PARTNERS TAKING ACTION:
CONNECTING COMMUNITIES

Through the Wataynikaneyap Power Project, First Nations communities in Ontario are managing the development of major infrastructure within their traditional lands to lay the groundwork for greater prosperity and economic self-determination. This project, the largest First Nations grid connection project in Ontario and a model for development, connects 16 First Nations to the provincial power grid. Construction and development of the project are estimated to generate approximately $1.2 million in economic benefits and to create more than 260 jobs in Northwestern Ontario.

www.canada.ca/en/indigenous-services-canada/news/2018/03/northern-ontario-grid-connection-project.html

CANADA IN THE WORLD

Ensuring Canada has one of the cleanest electricity systems in the world supports SDG 7 Affordable and Clean Energy.

Target 7.2 – By 2030, increase substantially the share of renewable energy in the global energy mix.

It also supports other international agreements and initiatives, including the Clean Energy, Education and Empowerment (C3E or Women in Energy) Initiative. Canada joined in June 2016, and appointed 4 ambassadors to this initiative to inspire more women to enter into careers in the clean energy field, equip them for success, prepare them for opportunities, and evaluate barriers to entry. While empowering women, the initiative will lead to developments in the clean energy sector.

HEALTHY COASTS AND OCEANS

Responsible Minister: Minister of Fisheries, Oceans and the Canadian Coast Guard

COASTS AND OCEANS SUPPORT HEALTHY, RESILIENT AND PRODUCTIVE ECOSYSTEMS.

THIS CAN BE ACHIEVED BY PROACTIVELY CONSERVING A GREATER PROPORTION OF CANADA'S COASTS AND OCEANS AND BY ADOPTING SUSTAINABLE MANAGEMENT OF AND HARVESTING FROM OUR MAJOR FISH STOCKS. REDUCING THE POLLUTANT LOAD, SUCH AS THE NUMBER AND VOLUME OF POLLUTION SPILLS FROM SHIPS, WILL HELP PROTECT THE MARINE ENVIRONMENT.

WHY IT'S IMPORTANT

Coastal and marine areas are vital to ecosystem health, providing benefits such as recreation, tourism, food and materials, employment opportunities and improved human health. Because Canada's ocean resources are vast, protecting the country's waters is critical to the lives and livelihoods of Canadians.

Canada's coasts and oceans, however, are facing significant challenges, among them rising sea levels, that are causing marine habitats to be compromised or lost. Overfishing and pollution are also putting pressure on marine life and overall ecosystem health, including the abundance and health of fish stocks.

ACHIEVEMENTS		
TARGET	**By 2020, 10% of coastal and marine areas are conserved.**	**Progress is:** **UNDERWAY – ON TRACK**
RESULT	From 1990 to 2014, protected coastal and marine areas increased from 0.34% of Canada's marine territory to 0.9%. As of December 2017, close to 8% of coastal and marine areas were conserved.	
TARGET	**By 2020, all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably.**	**Progress is:** **UNDERWAY – ATTENTION REQUIRED**
RESULT	In 2015, 96% of 159 major fish stocks were harvested at sustainable levels. In 2016, 96% of 170 major fish stocks were harvested at sustainable levels. There are currently insufficient data to report on the sustainable management and harvest of aquatic plants.	

MEETING THE TARGETS

Marine protected areas and other effective area-based conservation measures are key elements of Canada's strategy to maintain the health of coasts and oceans. The importance of Indigenous Peoples as environmental stewards is also recognized, as is their traditional use of coastal and marine areas.

The federal government is currently on track to meet its 10% conservation target, with almost 8% of Canada's marine and coastal areas currently conserved, a more than fivefold increase over the last 5 years. This significant increase can be attributed to establishing several new marine protected areas and 51 marine refuges announced since 2016.

To ensure fish stocks are protected and conserved for future generations, the Government of Canada is implementing harvest and management strategies. Federal management of fisheries is grounded in ecosystem-based, precautionary and emerging ecosystem approaches. This means that when establishing harvest limits, environmental effects on fish stocks and the effects of fishing on the wider environment are considered, frameworks to manage risks are applied, and uncertainty is not used as a reason for inaction.

These approaches support the federal government's 2020 target of 100% of fish stocks harvested at sustainable levels. In 2016, 96% of 170 major fish stocks were managed and harvested at levels considered to be sustainable.

There has been slower progress in achieving other aspects of the target. Some data gaps exist for "bycatch" species (accidentally caught fish).

However, Canada is making progress in applying an ecosystem approach in fisheries that is working to take into account the effects of the marine environment on stocks and the effects of fisheries on the marine environment, by implementing Sustainable Fisheries Framework Policies and factoring environmental effects into science advice. At this time, however, there also remains no settled methodology for managing fisheries and stocks on an ecosystem basis.

The federal government also monitors pollution releases into the marine environment, and manages Canada's ocean disposal sites. The federally designated disposal sites have been monitored since 2007, and no evidence has been found of marine pollution from the disposal of permitted materials (primarily dredged material, fish waste or excavation waste).

FIGURE 4. PROTECTED AND OTHER CONSERVED AREAS

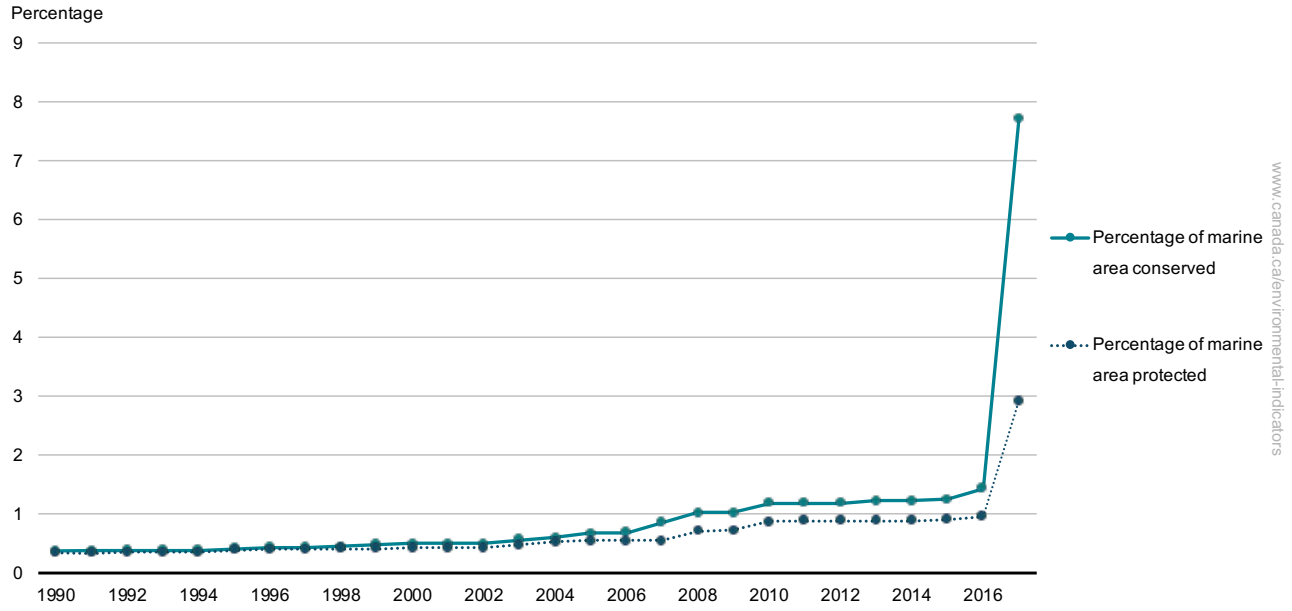
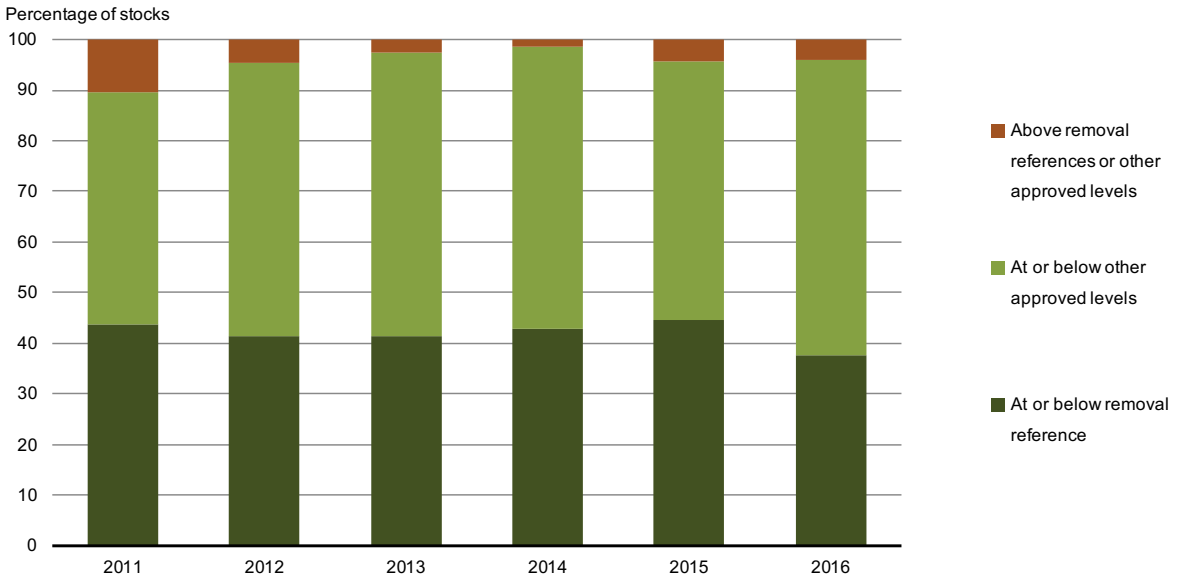
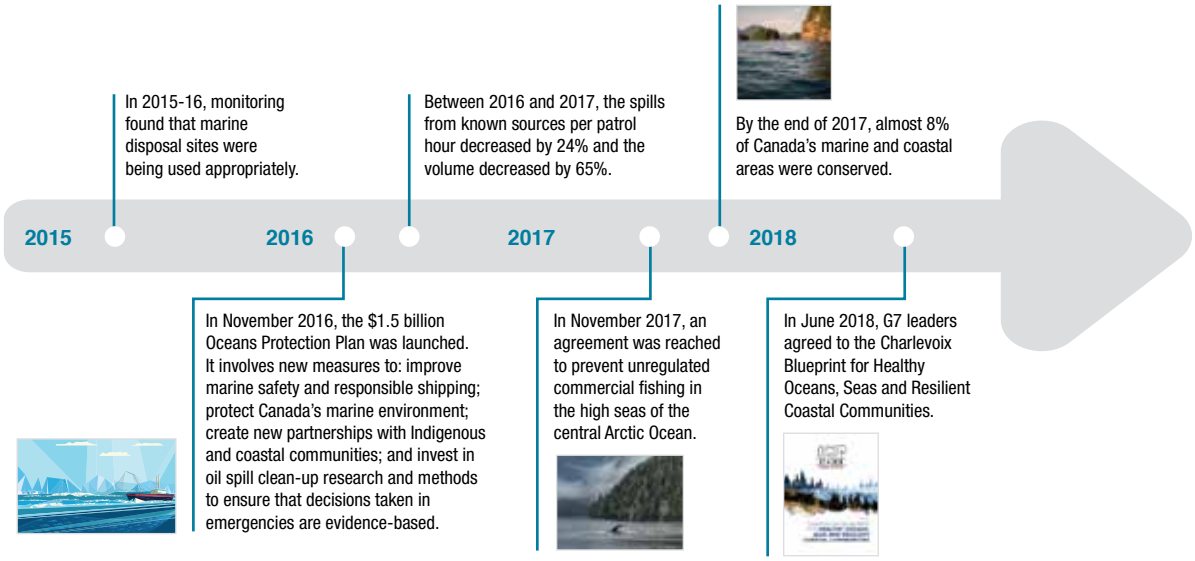


FIGURE 5. HARVEST OF MAJOR STOCKS RELATIVE TO APPROVED LEVELS



www.canada.ca/environmental-indicators

ACHIEVING THE MILESTONES



WHAT THE GOVERNMENT OF CANADA DID

Since 2016, the Government of Canada has made considerable progress towards protecting the country's marine and coastal areas. This included investing more than $90 million to advance marine conservation efforts, and to explore protection in collaboration with Indigenous and Northern partners in an area of the high Arctic known as "the last ice area", the one Arctic region expected to retain its summer sea ice until 2050. It also included establishing 3 new *Oceans Act* marine protected areas (MPAs):

- Anguniaqvia niqiqyuam in Darnley Bay, Northwest Territories;
- Hecate Strait and Queen Charlotte Sound Glass Sponge Reefs, British Columbia; and
- St. Anns Bank in Nova Scotia.

Other projects include:

- advancing MPA network development in 5 priority bioregions;
- proposed amendments to the *Oceans Act* to facilitate the MPAs designation process, which will enable the designation of Interim Protection MPAs;
- established 51 marine refuges covering approximately 275,000 km^2, or 4.78% of conserved marine area by 2017; and
- announced boundaries for:
  - three (3) new Areas of Interest, those that contain ecologically-sensitive land or species that need extra protection, in the Offshore Pacific, Eastern Shore Islands and Fundian Channel-Browns Banks;
  - one (1) newly proposed marine refuge, the Eastern Canyons conservation area; and
  - the proposed Tallurutiup Imanga National Marine Conservation Area in Lancaster Sound, Nunavut. (The Tallurutiup conservation area is approximately 109,000 km^2, or about twice the size of Nova Scotia.)

In addition, the new Scott Islands Marine National Wildlife Area located off the northwest of Vancouver Island was announced in September 2018. This is the first protected marine area established under the *Canada Wildlife Act*.

The Government of Canada has also taken steps to improve fisheries management by:

- investing $65.1 million in 2016 to support fisheries protection, which included $12.8 million for managing aquatic invasive species;
- making additional investments in 2017 to support:
  - developing stock rebuilding plans ($950,000 over 4 years);
  - improving catch monitoring ($5.9 million over 4 years);
  - completing Integrated Fish Management Plans for managing the fishery of a particular species in a given region. These plans combine the best available science on a species with industry data on capacity and methods for harvesting that species ($2 million over 4 years); and
  - implementing the Sustainable Fisheries Framework policies ($6.3 million over 4 years).

Additional initiatives related to oceans are also underway.

- The National Strategy to Address Abandoned and Wrecked Vessels in the Oceans Protection Plan is a key action being taken to protect oceans and clean up waterways.
- Legislation was introduced in the Spring of 2017 to formalize a moratorium on oil tankers carrying crude oil or persistent oil products from entering or leaving ports and marine installations on British Columbia's northern coast, which includes the Great Bear Rainforest and Great Bear Sea area.

Jolinne Surrette

North Atlantic Right Whales

In June 2018, Canada's $167.4 million Whales Initiative was announced to protect and support the recovery of endangered, iconic whale populations: Southern Resident Killer Whales, North Atlantic Right Whales and St. Lawrence Estuary Beluga Whales. Some of the 2018 ongoing and planned protection measures for the Southern Resident Killer Whales include reducing speed of ships, moving ships away from key foraging areas, more scientific research and monitoring for contaminants, increasing monitoring for whales, closing fishing areas to help with availability of prey and keeping vessels away from whales. Building on the Oceans Protection Plan, in October 2018 $61.5 million was invested in measures to address key threats to the survival and recovery of Southern Resident Killer Whales. For example, additionnal areas of important habitat and plans to protect it are being identified.

Some of the 2018 North Atlantic Right Whales protection measures include increased monitoring for whales, reducing speed of ships, using less rope in the water, keeping better track of buoys, and managing shipping and fishing areas where whales are present. In March 2018, $1.7 million annually, was announced to support marine mammal response under the National Marine Mammal Response Program.

The *Microbeads in Toiletries Regulations* that came into force July, 2018 prohibits the manufacture, import, and sale of toiletries containing plastic microbeads. These micro-plastics have been observed in industrialized coastal waters, in the open ocean, and even in the Arctic. Recent research indicates that microbeads have adverse short-term and long-term effects in aquatic organisms.

RISKS AND CHALLENGES TO MEETING THE TARGETS

- Aligning the economic interests of Canada's marine sector with maintaining the health and sustainability of coasts and oceans is complex and challenging.
- Increased marine shipping poses environmental risks such as:
  - increased pollution from noise, abandoned and wrecked vessels, the entry of invasive species, oil spills, etc.; and
  - adverse effects on marine mammals.
- While plans have been developed to rebuild critically low fish stocks, some stocks face especially challenging environmental conditions which may impede their rate of recovery, notably warming waters as a result of climate change.

- A greater understanding of at-risk whale behaviour and biology is needed to develop more effective mitigation measures and promote recovery.
- Plastic waste in the ocean is a major environmental issue, given its negative impacts on marine life.
- Better understanding and further research is required of the potential effects of drugs and pesticides used in aquaculture on fish-bearing waters and habitats.

PARTNERS TAKING ACTION:

OCEAN WISE'S PLASTIC WISE INITIATIVE

Ocean Wise, a non-governmental organisation and research partner of the federal government, is challenging the public to break their plastics habits.

In 2018, with the help of the Port of Vancouver and retailer Mountain Equipment Co-op, Ocean Wise established the #BePlasticWise pledge – part of an initiative to tackle the global problem of ocean plastic.

By signing the #BePlasticWise pledge, individuals commit to reducing their reliance on disposable, single-use plastic items: www.ocean.org/pledge

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CANADA IN THE WORLD

Ensuring Canada's coasts and oceans support healthy, resilient and productive ecosystems also supports SDG 14 Life Below Water.

Target 14.1 – By 2025, prevent and significantly reduce marine pollution of all kinds, in particular from land-based activities, including marine debris and nutrient pollution.

Target 14.2 – By 2020, sustainably manage and protect marine and coastal ecosystems to avoid significant adverse impacts, including by strengthening their resilience, and taking action for their restoration in order to achieve healthy and productive oceans.

Target 14.4 – By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristics.

Target 14.5 – By 2020, conserve at least 10% of coastal and marine areas, consistent with national and international law and based on the best available scientific information.

Work under this goal also supports progress towards the 2020 Biodiversity Goals and Targets for Canada and the global conservation objectives of the United Nations Convention on Biological Diversity, in particular, by conserving coastal and marine areas (Canada Target 1) and promoting sustainable fish harvests (Canada Target 9).

PRISTINE LAKES AND RIVERS

Responsible Minister: Minister of Environment and Climate Change

CLEAN AND HEALTHY LAKES AND RIVERS SUPPORT ECONOMIC PROSPERITY AND THE WELL-BEING OF CANADIANS.

PROGRESS CAN BE MADE TOWARDS THE GOAL BY REDUCING PHOSPHOROUS AND OTHER NUTRIENT LOADING IN KEY WATER BODIES, AS WELL AS CONTAMINATION IN THE GREAT LAKES, THE ST. LAWRENCE RIVER AND INDUSTRIAL EFFLUENTS.

WHY IT'S IMPORTANT

Lakes and rivers across Canada sustain a rich variety of plants and animals, supply the drinking water for most Canadians, and support industries such as tourism, fisheries, agriculture and shipping. Canadian rivers discharge close to 9% of the world's renewable water supply and the Great Lakes contain almost 20% of world's surface freshwater.

The quality of water and the health of rivers and lakes largely depend on how communities use the surrounding land. Urban and agricultural run-off can cause excessive nutrient levels, which can lead to harmful algal blooms, as well as zones of low oxygen (hypoxia) in lakes and rivers. Many of these algae varieties degrade aquatic habitat, clog water intakes, increase water treatment costs, and disrupt fisheries, tourism and recreation affecting local economies.

In addition, a significant number of Canadian lakes and rivers are contaminated and adversely impacted by mining effluent, run-off from agricultural lands and invasive alien species. (See box in Healthy Wildlife Populations chapter.)

ACHIEVEMENTS

TARGET	**Reduce phosphorus loading into Lake Erie by 40% to achieve the binational (Canada-US) phosphorus targets from a 2008 baseline.**	**Progress is:** **DATA TO REPORT ON TREND SHOULD BE AVAILABLE BY 2023**
RESULT	**Phosphorus loading in 2008 was 10,843 tonnes. For Canada, the reduction target represents 212 tonnes to the central basin. Work is underway to track the loading reductions through Flow Weighted Mean Concentration, which removes variation in loads due to hydrology (for example, precipitation events and snow melt).**	
TARGET	**Reduce 2000 kilograms (kg) of phosphorus per year to Lake Simcoe.**	**Progress is:** **ACHIEVED**
RESULT	**Through stewardship projects completed between 2008 and 2017, the cumulative annual reduction was 6188 kg of phosphorus per year in Lake Simcoe, exceeding the target of 2000 kg per year.** **The Lake Simcoe/South-eastern Georgian Bay clean-up fund ended in March 2017.**	

ACHIEVEMENTS

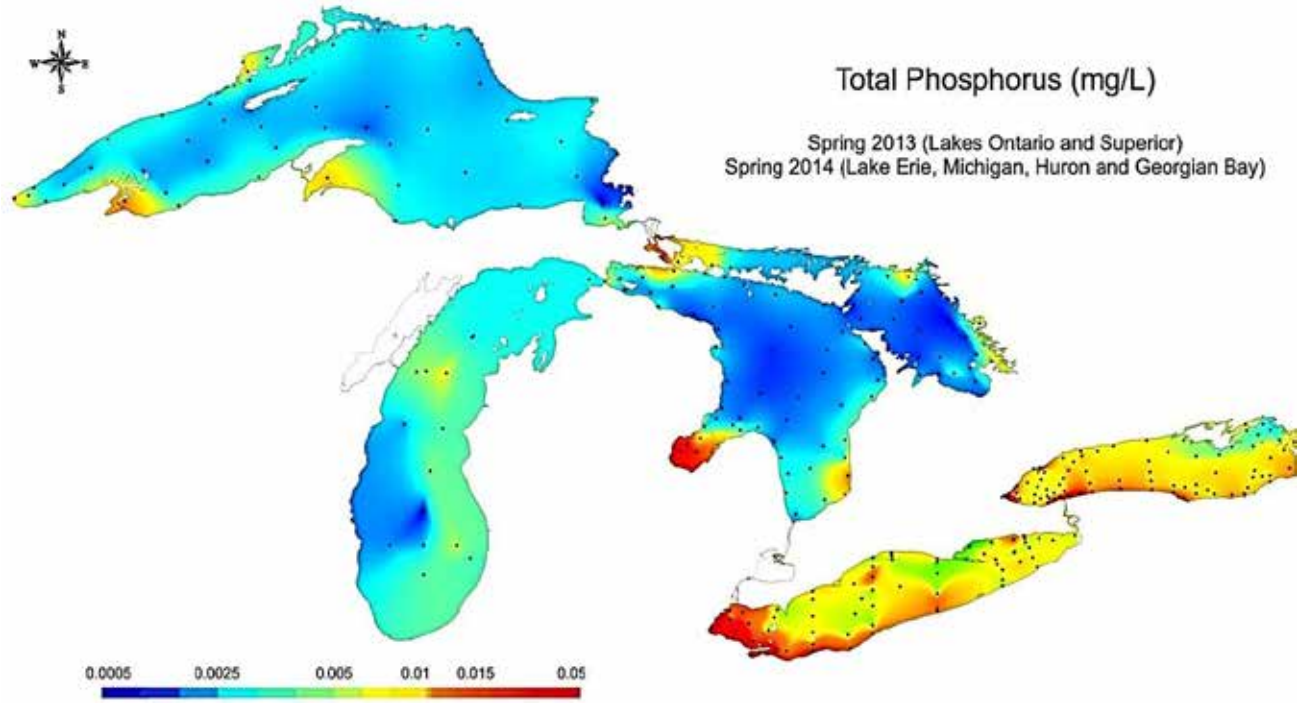
TARGET	By 2019, 85% of the indicators of the Overview of the State of the St. Lawrence achieve a result considered intermediate or better to conserve biodiversity, improve water quality and ensure sustainable use of the river.	Progress is: DATA UNAVAILABLE FOR THIS REPORTING CYCLE. THE NEXT REPORT WILL BE AVAILABLE IN 2019
RESULT	In 2014, 80% of the indicators of the Overview of the State of the St. Lawrence achieve results considered intermediate (moderate) or better.	
TARGET	By 2019, restore beneficial uses in 5 Canadian Great Lakes Areas of Concern (AOCs) and in the remaining AOCs, increase the number of beneficial use impairment re-designations from 18 in 2014 to 30 in 2019.	Progress is: UNDERWAY – ATTENTION REQUIRED
RESULT	In 2018, of the 5 AOCs targeted for the completion of delisting restoration actions, 3 AOCs are on track to meeting the 2019 target and 2 will not be completed until after 2019. Since the program began in 1987, 61 beneficial use impairments (BUI) in Canadian Great Lakes Areas of Concern have been restored and re-designated to Not Impaired status. 12 re-designations have occurred since 2014: - seven (7) in Areas of Concern targeted for restoration; and - five (5) in the remaining AOCs, increasing the number of re-designation to 23 and moving closer to the goal of 30 in 2019.	

MEETING THE TARGETS

Almost 90% of Canada's land and inland waters fall under provincial or territorial jurisdiction. Through programs, funding and scientific activities, the federal government complements provincial and territorial initiatives to reduce water pollution and help ecosystems. The reduction of phosphorus loading to Lake Erie and Lake Winnipeg, in particular, are key priorities for both federal and provincial programming due to ongoing concerns about nutrient levels.

Working with provinces and territories, the federal government contributes to the protection of lakes and rivers through management of fisheries, protection of habitat, monitoring of ecosystems, navigation, federal lands, and the management of boundary waters shared with the United States, such as the Great Lakes.

FIGURE 6. TOTAL PHOSPHORUS IN THE GREAT LAKES



(Source ECCC, USEPA)

The federal government is also actively involved in monitoring the health of the country's many lakes and rivers.

REDUCING NUTRIENT POLLUTION TO LAKES AND RIVERS

Of all the Great Lakes, concentrations of total phosphorus are highest and most variable in Lake Erie. In 2016, Canada and the United States established phosphorus reduction targets for Lake Erie.

While concentrations have declined overall since the 1970s, the recent trend for total phosphorus in the lake is unclear. The amount of phosphorus going into Lake Erie is dependent in large part on runoff from the land, with phosphorus loads being highest in late winter and spring, and during years that receive more rain.

Through stewardship projects completed between 2008 and 2017, phosphorus loads were reduced by 6188 kg per year in Lake Simcoe, this level exceeded the target of 2000 kg per year.

Through Lake Winnipeg stewardship projects, 29,715 kg of phosphorus loads were reduced in Lake Winnipeg and its tributary rivers between 2010 and 2017. This exceeded the established target of 10,800 kg. In addition, a one-time reduction of 21,345 kg of phosphorus was prevented in 2015, with the bioremediation of a retired municipal watershed lagoon.

In 2018, the Governments of Canada and Ontario released the Lake Erie Action Plan for reducing phosphorus loadings to Lake Erie. The plan contains commitments to more than 120 concrete actions by federal and provincial agencies, and their key partners. It is expected that projects supported through the first round of funding under the Great Lakes Protection Initiative will reduce phosphorus loads by 18 tonnes.

RESTORING LAKE AND RIVER ECOSYSTEMS

In 2014, 80% of the indicators from the Overview of the State of the St. Lawrence showed results considered intermediate or better.

In 2017, the Government of Canada renewed its commitment under the Canada-Quebec Agreement on the St. Lawrence 2011 to 2026. This commitment provides funding for 38 joint projects and a total federal-provincial investment of $57.5 million over 5 years (2016 to 2021).

The 2017 State of the Great Lakes report assessed the nutrients and algae status as fair, with a trend of “unchanging” to “deteriorating”. The Great Lakes ecosystem includes 5 unique lakes each with their own assessment. For example, nutrients and algae in Lake Erie, the Great Lake in the poorest condition, are assessed as “Poor” and “Deteriorating”.

AREAS OF CONCERN IN THE GREAT LAKES

Areas of Concern (AOC) are locations regarded in the Great Lakes Water Quality Agreement as being the most environmentally degraded areas within the Great Lakes.

Under the 1987 Great Lakes Water Quality Agreement between Canada and the United States, 43 such sites were identified, 12 of which were Canadian and 5 of which were shared bi-nationally. A suite of 14 "beneficial uses" were assessed and beneficial use impairments identified within each Area of Concern. Together with numerous partners, remedial action plans were developed for each Area of Concern and are being implemented to restore water quality and ecosystem health.

An Area of Concern in Recovery is an area where all reasonable actions to restore beneficial uses have been carried out and time is required for the environment to recover.

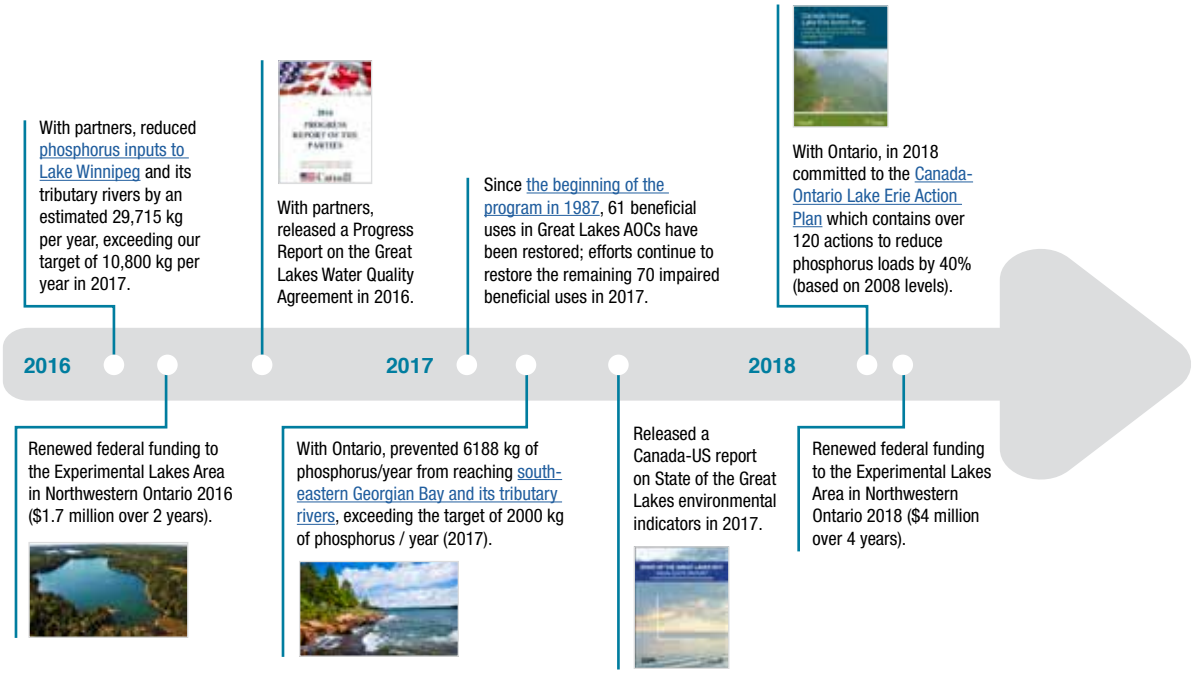
WHAT ARE BENEFICIAL USES?

Beneficial uses are best described as attributes of an aquatic ecosystem benefiting the economy, human health and the environment. A framework of 14 beneficial uses is set out in the Great Lakes Water Quality Agreement between Canada and the United States and is used to identify Areas of Concern and assess the success of remediation efforts. When all beneficial uses have been restored and re-designated as not impaired, these AOCs are removed from the list.

Federal environmental monitoring has revealed high compliance rates with *Fisheries Act* regulations on effluent.

- For the Pulp and paper industry, tests for toxicity in 2016 met regulatory standards 97.3% of the time and tests for biochemical oxygen demand and total suspended solids met regulatory standards 99.9% of the time.
- For the Metal mining industry in 2016, there was over 99.3% compliance for metals, cyanide and pH, 98% for total suspended solids, 95.7% for acute lethal toxicity.

ACHIEVING THE MILESTONES



WHAT THE GOVERNMENT OF CANADA DID

In Budget 2016, the Government of Canada invested $19.5 million to support the International Joint Commission in the management of transboundary water issues.

In Budget 2017, $70.5 million over 5 years was dedicated to continuing the protection of Canada's freshwater resources in the Great Lakes ($44.84 million over 5 years) and Lake Winnipeg Basins ($25.7 million over 5 years). Of the Budget 2017 investment in the Great Lakes, $26 million is allocated to prevent toxic and nuisance algae in Lake Erie.

In 2017, the Government of Canada began a study on the Ottawa River watershed and is engaging Canadians about the current issues and management of the watershed. The Ottawa River was designated a Canadian Heritage River and a Government of Quebec Lieu historique. The Ottawa River watershed is one of Canada's largest watersheds, encompassing more than 200 municipalities, representing more than 2 million residents and 20 Indigenous communities.

Also in 2017, the *Microbeads in Toiletries Regulations* were published. These regulations prohibit the manufacture, import and sale of certain toiletries that contain plastic microbeads. Recent research indicates that microbeads have adverse short-term and long-term effects on aquatic organisms.

In 2018, the Government of Canada amended the *Metal Mining Effluent Regulations* to improve the stringency of requirements for effluent and make diamond mines subject to these regulations.

RISKS AND CHALLENGES TO MEETING THE TARGETS

Intensive agriculture operations, mining operations and heavily used urban lands close to watercourses pose a risk to water quality. However, initiatives from the federal, provincial and municipal governments, such as the amendments to the *Metal Mining Effluent Regulations* in 2018 will improve pollution prevention measures.

- While the number of new aquatic invasive species entering the Great Lakes has been significantly reduced, those invasive species already in or around the Great Lakes, such as Sea Lamprey, Zebra and Quagga Mussels and Purple Loosestrife, continue to have negative environmental and economic impacts by blocking water flow, degrading water quality, and altering nutrient flows within the food web (State of the Great Lakes 2017). Lake Winnipeg has experienced similar ecosystem stress from excessive amounts of nutrients from both urban and rural sources and the growing infestation of zebra mussels.
- The Government of Canada is working on improving the coverage of new and existing environmental indicators.

PARTNERS TAKING ACTION:

EXPERIMENTAL LAKES AREA IS INFLUENCING WATER-MANAGEMENT POLICIES AROUND THE WORLD

In 2016, the Government of Canada renewed its funding ($1.7 million over 2 years) for the International Institute for Sustainable Development-Experimental Lakes Area in Northwestern Ontario. This area is one of a few places in the world where scientists can conduct research on actual lakes and ecosystems. By manipulating small lakes, scientists are able to examine how all aspects of the ecosystem respond and to extrapolate results to better understand global water and issues such as aquatic invasive species and other stressors influencing freshwater ecosystems. For example, scientists may simulate an oil spill in one small confined lake to better understand the effects on fresh water. The Government of Ontario provides up to $2 million each year to the International Institute for Sustainable Development-Experimental Lakes Area and the Province of Manitoba has committed more than $6 million over 6 years.

CANADA IN THE WORLD

Ensuring Canada's lakes and rivers are pristine supports SDG 6 Clean Water and Sanitation.

Target 6.3 – By 2030, improve water quality by reducing pollution, eliminating dumping, and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.

Work under this goal also supports progress towards the 2020 Biodiversity Goals and Targets for Canada and the global conservation objectives of the United Nations Convention on Biological Diversity, in particular, to decrease pollution from excess nutrients.

SUSTAINABLY MANAGED LANDS AND FORESTS

Responsible Ministers: Minister of Environment and Climate Change; Minister of Natural Resources

LANDS AND FORESTS SUPPORT BIODIVERSITY AND PROVIDE A VARIETY OF ECOSYSTEM SERVICES FOR GENERATIONS TO COME.

THIS CAN BE ACHIEVED BY CONSERVING LAND THROUGH PROTECTED AREAS, MONITORING THE ECOLOGICAL INTEGRITY OF CANADA'S NATIONAL PARKS AND MAINTAINING THE TIMBER HARVEST AT SUSTAINABLE LEVELS.

WHY IT'S IMPORTANT

Canada's forests, wetlands, peatlands, prairies and tundra all provide essential habitats for wildlife populations and support biodiversity. Sustainable management of Canada's lands and forests, including conservation, is essential to maintain the environmental, economic and cultural benefits over the long term. These lands and forests filter air and water, regulate flooding and store carbon dioxide. Many of these places hold cultural and spiritual significance for Indigenous peoples and other Canadians.

Canada's lands and forests also contribute to the Canadian economy. In 2016, the forest industry alone represented approximately 1.2% of Canada's gross domestic product (or roughly $23 billion), providing over 200,000 jobs across the country. (State of Canada's Forests Report: pages 44 and 51.) Canada's national parks and historic sites generate about $3.3 billion annually, supporting approximately 40,000 full-time jobs. Protecting lands and forests through sustainable use is necessary to maintain these economic benefits over the long term.

ACHIEVEMENTS

TARGET	**By 2020, at least 17% of terrestrial areas and inland water are conserved through networks of protected areas and other effective area-based conservation measures.**	**Progress is:** **UNDERWAY – ATTENTION REQUIRED**
RESULT	**As of December 2017, 10.5% of terrestrial and inland water areas were protected, a small increase from 10.3% reported for 2015.**	
TARGET	**By 2019, the condition of 90% of ecological integrity indicators in national parks is maintained or improved.**	**Progress is:** **UNDERWAY – ATTENTION REQUIRED**
RESULT	**As of March 2018, the ecological integrity of 88% of Canada's national park ecosystems was either maintained or had improved from 2013.**	

ACHIEVEMENTS

TARGET

Between now and 2020, maintain Canada's annual timber harvest at or below sustainable wood supply levels.

RESULT

Between 1990 and 2016, the timber harvest in Canada has remained below sustainable wood supply levels. Since 2012, the levels have ranged from 65% to 69%, which is well under the supply levels considered to be sustainable.

Progress is:

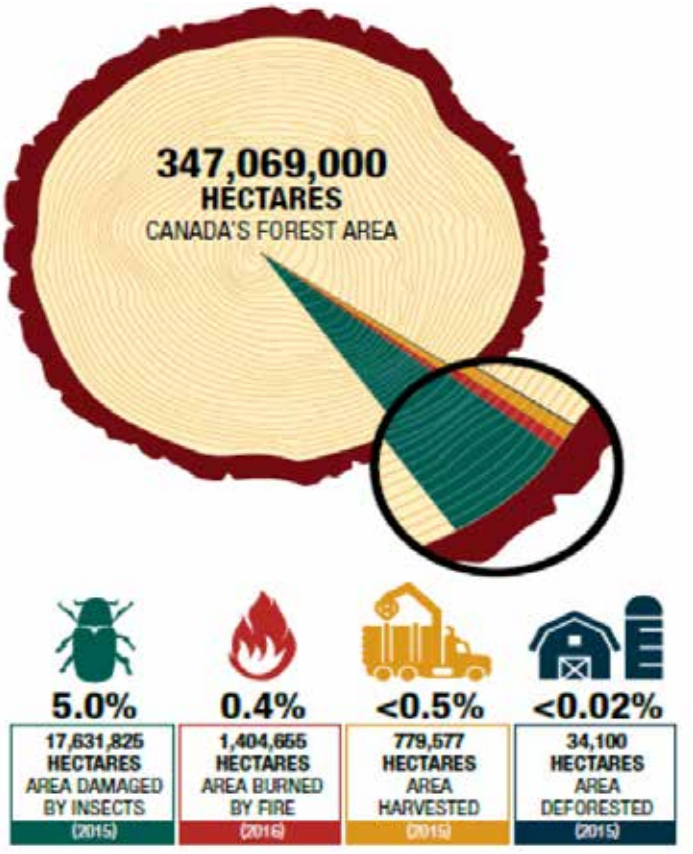
UNDERWAY – ON TRACK

MEETING THE TARGETS

Managing lands and forests sustainably involves conserving land and inland water areas, maintaining healthy park ecosystems, and, through regulation, oversight and management, harvesting timber at sustainable levels. This work is undertaken by Indigenous, municipal, provincial, territorial and federal levels of government, alongside citizens, academic institutions, industry and non-governmental organisations.

The federal government has made some progress in conserving lands and inland waters: between 2016 and 2017 approximately 2275 km^2 were conserved. The federal government continues to monitor and assess the ecological integrity of national parks. As of March 2018, the ecological integrity of 88% of Canada's national park ecosystems was either maintained or had improved from 2013. This means these ecosystems were considered intact in terms of their physical elements (water and rocks), biodiversity (composition and abundance of species), and ecosystem processes.

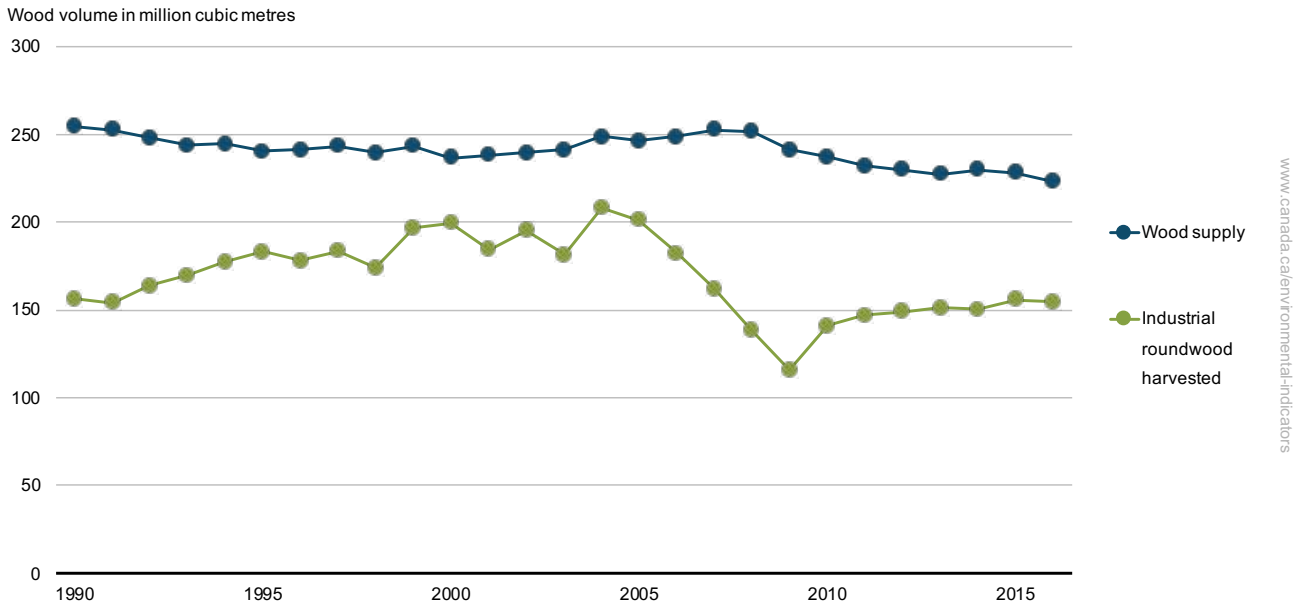
As of 2016, Canada's annual timber harvest remained well within the level considered sustainable, at about 69% of the estimated wood supply.



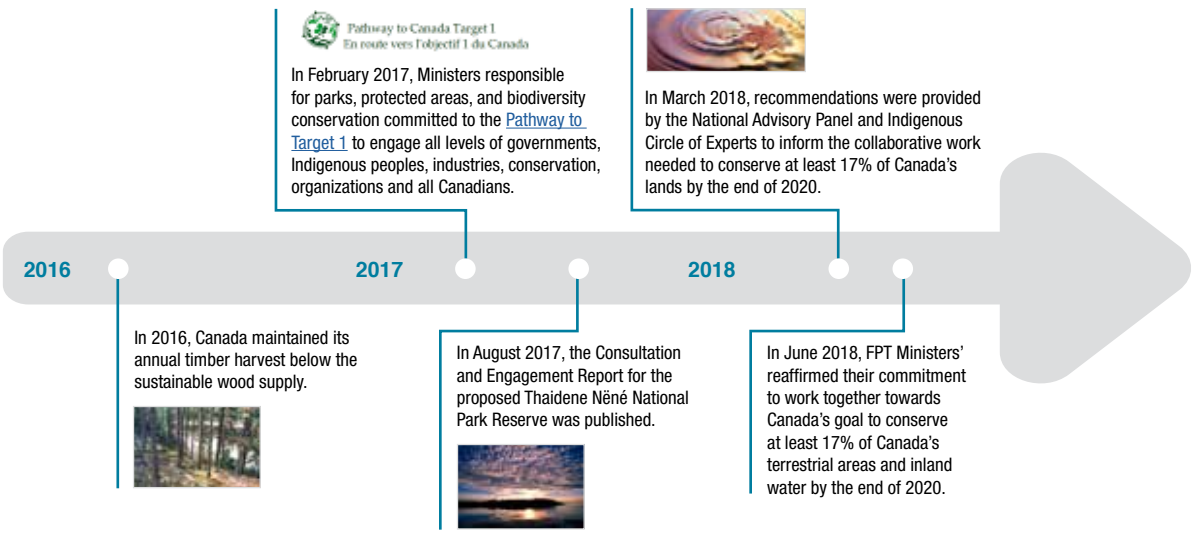
New knowledge and tools support sustainable management of Canada's forests and a sustainable market for forest products. The government continues its commitments to sustainable forest management by, for example, spending $139.1 million in 2016-17 on forest science, technology and related activities. These include improving the National Forest Carbon Monitoring, Accounting and Reporting System, and, developing forest ecosystem-based strategies and tools for restoring ecological integrity of forests impacted by non-renewable natural resource development.

The Canadian Forest Service tracks the state of Canada's forests using its forest sustainability indicators. Overall, Canada's forests continue to be managed sustainably, as evidenced by the regeneration of harvested Crown lands by planting or seeding, and the low harvesting rate. Furthermore, on an annual basis, less than 0.02% of land is permanently changed from forest to other land uses.

FIGURE 7. WOOD SUPPLY AND ANNUAL HARVEST OF INDUSTRIAL ROUNDWOOD



ACHIEVING THE MILESTONES



WHAT THE GOVERNMENT OF CANADA DID

In February 2017, Ministers responsible for parks, protected areas, conservation, wildlife and biodiversity committed to the Pathway to Canada Target 1: to engage all levels of government, Indigenous peoples, industries, conservation organizations, and all Canadians. The Minister of Environment and Climate Change co-chairs the Pathway work with the Government of Alberta, and is providing leadership and support to this wide ranging collaborative process. Having established and received recommendations from a National Advisory Panel and an Indigenous Circle of Experts, work under the Pathway has provided a new set of definitions and policies to enable the use of new concepts, such as Indigenous protected and conserved area and other effective conservation measures.

Pathway to Canada Target 1
En route vers l'objectif 1 du Canada

Canada Target 1 is one of the 2020 Biodiversity Goals and Targets for Canada that deals with the conservation of terrestrial areas and inland water, and marine and coastal areas of Canada. The Pathway to Canada Target 1 project is developing a plan to meet the terrestrial and inland water elements of the target. The plan will describe how conservation partners across the country will meet the target through: protected areas, Indigenous protected and conserved areas (IPCAs), and other effective area-based conservation measures (OECMs).

In Budget 2018, the Government of Canada committed to expanding the system of national parks and national wildlife areas and work with partners to conserve Canada's lands and forests. In June 2018, Ministers responsible for parks, protected areas, conservation, wildlife and biodiversity reaffirmed their commitment to work together towards Canada's goal to conserve at least 17% of Canada's terrestrial areas and inland waters by the end of 2020.

To conserve a greater proportion of Canada's lands and forests, the Government of Canada is leading and collaborating with others on a number of initiatives.

Wood Buffalo National Park is the largest national park in Canada and a World Heritage Site. Despite its remoteness and size, the park is vulnerable to the cumulative impacts of external development pressures outside its boundaries. This is particularly true for the Peace Athabasca Delta, where impacts from these external pressures and climate change are impacting water quality and water quantity.

THE WORLD'S LARGEST BOREAL PROTECTED FOREST

In May 2018, the Government of Alberta announced the creation of 13,000 square km of new protected areas in northern Alberta. The Kazan, Richardson and Birch Wildland Provincial Parks connect the Wood Buffalo National Park to other protected areas in the region – resulting in the largest contiguous protected area of boreal forest in the world.

Currently, the Government of Canada is leading the development of an action plan for the Wood Buffalo National Park World Heritage Site in response to a 2017 request by the World Heritage Committee to take action to ensure the on-going protection of the site's Outstanding Universal Value. The action plan's development is a collaborative effort with the Governments of Alberta, British Columbia, and the Northwest Territories, and with Indigenous partners and stakeholders.

In 2017, the Government of Canada and the Qikiqtani Inuit Association officially opened the Qausuittuq National Park on Bathurst Island (originally announced in 2015). It protects approximately 11,000 km^2 of Arctic lands and waters, and includes the northern part of Bathurst Island, the Governor General Islands to the west, and smaller islands to the west and north of Bathurst Island.

In 2017, the Governments of Canada and British Columbia, along with representatives from the Syilx/Okanagan Nation, announced a renewed commitment to work together to establish a national park reserve in South Okanagan-Similkameen.

THE CANADA NATURE FUND

Budget 2018 announced an historic investment of $1.35 billion (over 5 years) in the Nature Legacy for Canada to advance work with species at risk and protected and conserved areas. This investment includes a $500 million Canada Nature Fund. This $500 million federal investment will be matched by corporate, not-for-profit, and provincial, territorial governments and other partners who will contribute an additional $500 million through matching contributions to raise a total of $1 billion for conservation action. The Canada Nature Fund will make it possible to secure private lands, support provincial and territorial species protection efforts, and help build Indigenous capacity to conserve land and species.

The Canada Nature Fund will function as a two-stream contribution fund. The 'Species' stream totalling approximately $200 million over 5 years, is focused on the protection and recovery of species at risk, and the 'Spaces' stream, totalling $300 million over 5 years, is focused on supporting the Pathway to Canada Target 1. The Spaces stream has a number of sub-components including:

- a $10 million Quick Start component to identify and support near-ready protected areas in 2018-19 for CanadaTarget 1;
- a Challenge component, which will allocate up to $175 million in funding to support the establishment of protected and conserved areas, including up to 35 Indigenous Protected and Conserved Areas, making significant progress towards Canada Target 1 and contributing meaningfully to reconciliation; and
- $100 million to land trust organizations to secure important habitat in biodiversity rich areas.

In October 2018, the Government of Canada announced the creation of the Edéhzhíe Indigenous Protected and Conserved Area, which will also be designated as a National Wildlife Area under the *Canada Wildlife Act* before 2020.

The Canadian Council of Forest Ministers endorsed the Bioeconomy Framework in 2017 which supports the shift towards a bioeconomy and the adoption of innovative forest management practices. This framework will help Canada meet its GHG reduction targets under the Paris Agreement by converting sustainably managed, renewable forest-based resources into value-added products and services.

RISKS AND CHALLENGES TO MEETING THE TARGETS

- Most of the new areas needed to reach the 17% target are on provincial, territorial and Indigenous lands. Decisions at various levels by these governments could be delayed, given the complexity of planning, negotiation and coordination.
- The processes for establishing protected and conserved areas are time-consuming, and depend on a variety of factors, including partner and stakeholder support.
- Protected and conserved areas are also vulnerable to stresses, such as, urban and rural development, pollution, invasive alien species and climate change. (See the Healthy Wildlife Populations chapter.) Such pressures can result in the loss or impairment of ecosystems and greater stress on species at risk (see the Healthy wildlife populations chapter). These can also impair ecological and cultural values of heritage places, including a sense of connection to place.
- Climate change is posing challenges to the forest industry with increased risks from fires, pests, droughts, changing growth rates and distributions of tree species. Researchers from Natural Resources Canada's Canadian Forest Service are investigating the possibility that Canada's forests could be altered in new and significant ways by climate change and increased natural disturbances, particularly if there are no effective adaptation measures in place.

PARTNERS TAKING ACTION:

THE BUDWORM TRACKER PROJECT – CITIZEN SCIENCE

Spruce budworm is the main defoliator of conifers (trees with needles) in Canada's forests. In early spring, larvae (caterpillars) emerge from hibernation and eat the young needles on the trees. Outbreaks of spruce budworm tend to be widespread and severe. The 2006 outbreak, which began in Quebec, affected 7 million hectares by 2015. Citizen science involves volunteers gathering data to help scientists answer research questions. The Budworm Tracker project is giving volunteers in Eastern Canada the tools to gather and report data on spruce budworm populations. Volunteers receive a free Budworm Tracker kit containing a pheromone trap, a data collection sheet and detailed instructions. They hang their trap from a lower branch of a spruce or balsam fir tree near where they live or work. From mid-June until the end of the summer, these citizen scientists check the trap at least once a week, collecting and counting the moths and recording their findings. The volunteers then mail the data sheet and the moths back to the researchers, who validate and analyze the data.

A young citizen scientist checks a Budworm Tracer pheromone trap for spruce budworm moths.

CANADA IN THE WORLD

Ensuring lands and forests support biodiversity and provide a variety of ecosystem services for generations to come also supports SDG 15 Life on Land.

Target 15.1 – By 2020, ensure the conservation, restoration and sustainable use of terrestrial and inland freshwater ecosystems and their services, in particular forest, wetlands, mountains and drylands, in line with obligations under international agreements.

Target 15.2 – By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally.

Work under this goal also supports progress towards the 2020 Biodiversity Goals and Targets for Canada and the global conservation objectives of the United Nations Convention on Biological Diversity, in particular, by reinforcing the commitment to preserve lands and inland waters (Canada Target 1), and by working towards sustainable management of forests (Canada Target 6).

HEALTHY WILDLIFE POPULATIONS

Responsible Minister: Minister of Environment and Climate Change

ALL SPECIES HAVE HEALTHY AND VIABLE POPULATIONS.

ONGOING MONITORING OF SPECIES AT RISK, THE IMPLEMENTATION OF RECOVERY STRATEGIES AND MANAGEMENT PLANS EACH CONTRIBUTE TO THE GOAL OF ATTAINING HEALTHY AND VIABLE POPULATIONS OF ALL NATIVE SPECIES IN CANADA.

WHY IT'S IMPORTANT

Canada's plants and animals and their habitats make up ecosystems that benefit Canadians through valuable services such as providing food and medicines, purifying air and water, controlling floods, and pollinating crops.

Maintaining biodiversity – the variety of genes, species and ecosystems and the ecological processes of which they are a part – helps ensure that ecosystems continue to provide the services on which we depend. Biodiversity also has significant intrinsic and cultural value. Canadians have a stewardship responsibility to protect and recover all native wildlife species and to maintain the full range of biodiversity that occurs in Canada.

ACHIEVEMENTS

TARGET	**By 2020, species that are secure remain secure, and populations of species at risk listed under federal law exhibit trends that are consistent with recovery strategies and management plans.**	**Progress is:** **UNDERWAY – ATTENTION REQUIRED**
RESULT	Overall, nearly all species that were assessed as secure in the Wild Species 2010 report and reassessed in 2015 remained secure. As of May 2017, of the 113 species at risk for which population goals in recovery strategies or management plans, and information on recent trends are available, 43% showed progress consistent with objectives (compared to 38% in May 2015).	
TARGET	**By 2025, 59% of managed migratory bird species have population sizes within an acceptable range.**	**Progress is:** **NO NEW DATA. NEXT DATA RELEASE IS EXPECTED IN 2019**
RESULT	Previous data (released in 2013) showed that 57% of managed migratory bird species had population sizes within an acceptable range. An updated assessment of the status of migratory bird populations is expected by March 2019.	

KEY TERMS FOR SPECIES AT RISK:

A **secure** species is one that is at a very low or no risk of extinction or loss from Canada due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats.

A **Recovery Strategy** identifies what needs to be done to stop or reverse the decline of a species at risk. It sets goals and objectives and identifies the main activities to be undertaken.

A **Management Plan** sets goals and objectives for maintaining populations of one or more species that are particularly sensitive to environmental factors, but which are not in danger of becoming extinct. (Species at Risk Public Registry)

An **Action Plan** provides details on what needs to be done to achieve the population and distribution objectives identified in the recovery strategy, including the measures to be taken to address the threats and monitor the recovery of the species, as well as measures to protect critical habitat. The action plan also includes an evaluation of the socio-economic costs of the identified actions and the benefits to be derived from their implementation.

MEETING THE TARGETS

SPECIES AT RISK

Canada is home to about 80,000 species of wildlife, including animals, plants, and fungi. The Wild Species reports assess the status of Canada's species every 5 years. Trends in coverage indicate Canada is making significant progress in understanding the status of its biodiversity. The Wild Species 2015 report assessed the status in Canada of nearly 30,000 species, a substantial increase from 12,000 in the 2010 report. Based on the 2015 assessment, 80% of these species are estimated as being secure or probably secure in Canada. The remaining 20% are at varying levels of risk, with some species groups under particular stress (for example, 68% of reptile species are at risk). Among the approximately 6300 species that were assessed as secure in 2010, nearly all of them remained secure in 2015.

A key step in providing for the effective recovery of species assessed as "at risk" under the *Species at Risk Act* (SARA) is the development of a Recovery Strategy or Management Plan. From January 2016 to January 2018, the backlog of species requiring recovery strategies or management plans was reduced from 78 to 20. As of August 2018, there are 450 terrestrial species listed under SARA. Of these 450, 411 require recovery strategies or management plans, while 39 are not yet required under SARA. Proposed recovery strategies and proposed management plans have been published on the SARA Public Registry for 395 species and finalized for 328 species of the 450.

In 2017, an assessment was made of a sub-set of 113 species listed as at risk (Threatened, Endangered or Special Concern) under SARA that have quantitative recovery objectives in published recovery strategies or management plans, and data on population trends available through subsequent Committee on the Status of Wildlife in Canada (COSEWIC) assessments or progress reports published on the SARA public registry. As of May 2017, 49 of the 113 species (or 43%) were showing progress towards their objectives, while 51 (45%) were showing trends that were not consistent with their objectives, and the remainder had ambiguous trends.

Among 455 wildlife species that have been assessed more than once by the COSEWIC as of May 2017, and for which species limits remained the same, 65% showed no change in status, while 18% were in a lower risk category, and 18% were in a higher risk category. Changes in risk level can be a result of improved information rather than actual changes in the condition of the wildlife species. This is more likely to be the case for wildlife species that have improved in status than for wildlife species that have declined in status.

New tools to assess and protect habitat for species at risk are being developed, such as for Woodland Caribou (boreal population). The Government of Canada is currently negotiating conservation agreements with both short- and long-term actions needed to support the recovery of Boreal Caribou across the country. Commitments to accelerated timelines for range planning, habitat restoration and eventual protection of caribou and its habitat, as well the meaningful involvement and engagement with Indigenous peoples, are key outcomes that the Government of Canada is seeking in these negotiations.

While Canada is making progress towards the 2020 target for species at risk recovery, the data do not show strong enough evidence to indicate that the target will be met.

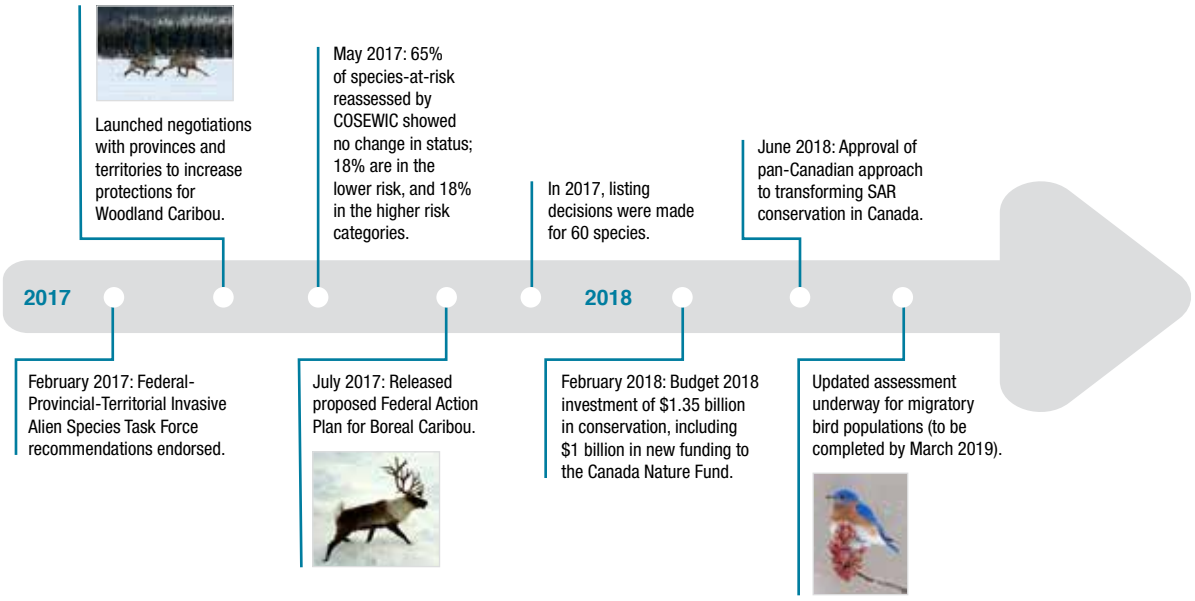
MIGRATORY BIRD SPECIES

Birds are useful as indicators of overall ecosystem health because they are sensitive to environmental changes. Most species of birds in Canada are protected under the *Migratory Bird Convention Act* and the federal government actively monitors migratory bird populations. The latest data from the Canadian Environmental Sustainability Indicators (CESI) program on managed migratory bird species (2013) shows that 57% had population sizes within an acceptable range. Most of the remaining species were below an acceptable range. An updated assessment will be completed by March 2019.

The lack of new data on managed migratory birds means that an assessment of progress against the goal's milestone cannot be completed at this time.

Extinct (X): A wildlife species that no longer exists.
Extirpated (XT): A wildlife species that no longer exists in the wild in Canada, but exists elsewhere.
Endangered (E): A wildlife species facing imminent extirpation or extinction.
Threatened (T): A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
Special Concern (SC): A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.
Data Deficient (DD): A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.
Not At Risk (NAR): A wildlife species that has been evaluated and found not to be at risk of extinction given the current circumstances. [COSEWIC]

ACHIEVING THE MILESTONES

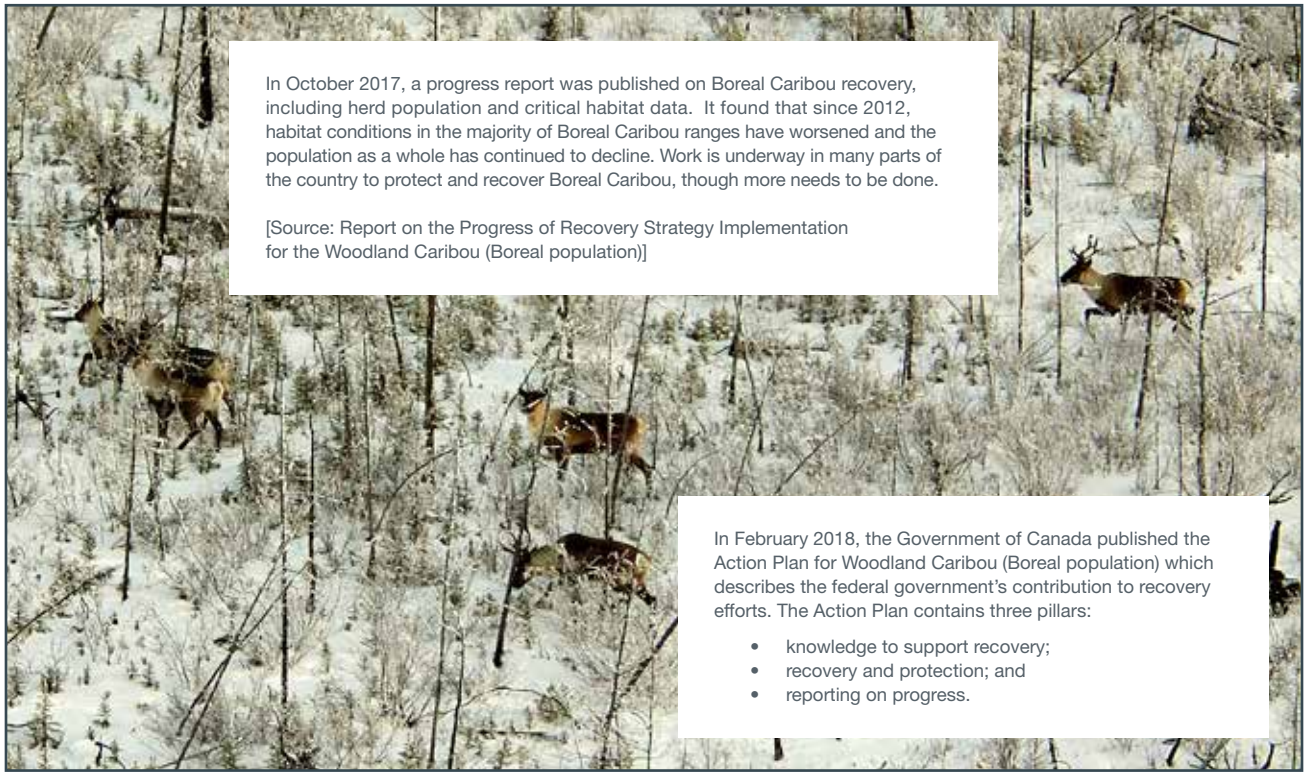


In December 2017, the Committee on the Status of Endangered Wildlife in Canada assessed that the Peregrine Falcon is no longer at risk of extinction. The falcon's recovery was enabled by a ban on DDT (a notoriously toxic pesticide), and by an extensive captive breeding program. (Peregrine Falcon © Gordon Court (CNW Group/Committee on the Status of Endangered Wildlife in Canada.)

WHAT THE GOVERNMENT OF CANADA DID

In February, Budget 2018 announced an investment of $1.35 billion (over 5 years) to accelerate action and progress on the conservation of nature through transforming approaches to the protection and recovery of species at risk, expanding and improving the management of connected networks of protected and conserved areas, and advancing national reconciliation by supporting the restoration of Indigenous rights and responsibilities for nature conservation. This investment includes $500 million from the federal government to create a new $1 billion Canada Nature Fund in partnership with corporate, not-for-profit, provincial, territorial and other partners.

The Canada Nature Fund will make it possible to provide incentives for conservation action by providing new resources through grants and contribution funding to partners to secure private land, establish new protected areas, support species protection and recovery efforts, and help build Indigenous capacity to conserve land and species. A portion of the new funds for species at risk recovery efforts are specifically targeted to support new work on Woodland Caribou, including conservation agreements with provinces and territories, partnerships with Indigenous peoples, and caribou science.



In October 2017, a progress report was published on Boreal Caribou recovery, including herd population and critical habitat data. It found that since 2012, habitat conditions in the majority of Boreal Caribou ranges have worsened and the population as a whole has continued to decline. Work is underway in many parts of the country to protect and recover Boreal Caribou, though more needs to be done.

[Source: Report on the Progress of Recovery Strategy Implementation for the Woodland Caribou (Boreal population)]

In February 2018, the Government of Canada published the Action Plan for Woodland Caribou (Boreal population) which describes the federal government's contribution to recovery efforts. The Action Plan contains three pillars:

- knowledge to support recovery;
- recovery and protection; and
- reporting on progress.

In February 2017, Ministers endorsed the Federal-Provincial-Territorial Invasive Alien Species Task Force's recommendations to improve national leadership and coordination on actions and emergency responses, and to enable Canadians to take action against invasive alien species that pose threats to biodiversity. Ministers also established a permanent federal-provincial-territorial Invasive Alien Species National Committee. These, in combination with earlier actions, are helping Canada ensure that pathways of invasive alien species introductions are identified, and risk-based intervention or management plans are put in place.

In June 2018, Federal-Provincial-Territorial (FPT) Ministers responsible for parks, protected areas, conservation, wildlife and biodiversity made a number of decisions and commitments that will greatly benefit healthy wildlife populations. These included:

- Approval of a Pan-Canadian Approach to Transforming Species at Risk Conservation in Canada, rooted in multi-species and ecosystem-based approaches. This includes principles to guide collaborative action, and common criteria for identifying shared priority places, species and threats/sectors. Ministers further agreed to establish and engage on a national set of shared priority places, species and threats and to initiate (or continue) implementation over the next year. By working together and through support from Canada's new Nature Fund, this will enable investments and innovative partnerships throughout the country to advance recovery and protection for a large number of species at risk.

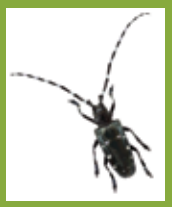
- Recognizing also that wildlife health is crucial in conserving biodiversity, Ministers endorsed a *Pan-Canadian Approach to Wildlife Health*. The goal of the approach is to strengthen Canada's capacity to identify and reduce wildlife health threats that put conservation, public health, or economic and cultural opportunities at risk, through:
  - development of programs and policies to reduce disparities and differences in wildlife health capacity across the country;
  - supporting wildlife management through research, policy and planning to better enable wildlife to cope with rapidly increasing anthropogenic and environmental changes; and
  - improving efficiency and effectiveness of programs by building linkages between federal, provincial and territorial governments, universities, and other stakeholders.
- Committing to continue to work together towards Canada's target to conserve at least 17% of terrestrial areas and inland waters by 2020.

The federal government also continued to monitor the health of Canada's wildlife through a broad range of migratory bird population surveys, including the 52nd year of the North American Breeding Bird survey, aerial and ground surveys of waterfowl, breeding surveys of shorebirds in the Arctic, seabird colony surveys on the Atlantic and Pacific coasts, and many others. These surveys provide the foundation for assessing the status of Canada's bird populations. They are important for managing sustainable populations of hunted species and for identifying key conservation actions to maintain or restore healthy populations of all species and prevent them from becoming species at risk.

RISKS AND CHALLENGES TO MEETING THE TARGETS

- Species at risk can take a long time to recover as the rate of recovery relates to their life spans, reproductive cycles, responses to human pressures, and the management of their ecosystem.
- Species can become threatened as a result of habitat loss or deterioration caused by agriculture, urban and rural development, pollution and climate change.
- The State of Canada's Birds 2012 report indicated that several species groups are showing large population declines, including grassland birds, shorebirds, and aerial insectivores. A 2016 report on the State of North America's Birds highlighted similar concerns, also noting that many oceanic birds in North America have major conservation concerns. Some of the largest declines were among species that migrate long distances. For example, grassland species that migrate from the Great Plains to Mexico's Chihuahuan grasslands have lost, on average, almost 70% of their continental populations since 1970.

EXAMPLES OF IAS IN CANADA



Insects such as Asian longhorned beetle (upper right), emerald ash borer and the gypsy moth.

Invasive plants such as the jointed goatgrass (lower right), phragmites and woolly cup grass.

Plant pathogens such as the plum pox virus and potato cyst nematode.

- According to the International Union for Conservation of Nature, invasive alien species are the second most significant threat to biodiversity after habitat loss and degradation. These species reach Canada by air, land or water pathways – whether through intentional or unintentional human action – leading to serious ecological and socio-economic consequences.
- Many wildlife species in Canada have not yet been assessed to determine their risk status, and as a result, there is not a complete picture of the health of wildlife populations.
- Many migratory bird species face threats outside Canada that can only be addressed through engaging internationally in conservation actions.

PARTNERS TAKING ACTION: RETURNING BAY OF FUNDY ATLANTIC SALMON TO THE WILD

Understanding that releasing wild adult salmon back into their native rivers could play a major role in bringing back inner Bay of Fundy Atlantic Salmon, Parks Canada spearheaded collaboration between Fisheries and Oceans Canada and Fort Folly First Nation, and partnered with local salmon farmers to grow large numbers of wild salmon smolt caught in park rivers. Working with Cooke Aquaculture and the Atlantic Canada Fish Farmers Association, these smolt are brought to the world's first marine conservation farm dedicated to wild Atlantic salmon. Once salmon reach maturity, they are released back into their rivers of their birth to create the next generation of wild salmon. Partnering scientists at the University of New Brunswick are seeing promising signs including adult salmon returns and restored ecosystem productivity resulting from higher salmon numbers in the river.

INVASIVE ALIEN SPECIES

Alien species are plants, animals and microorganisms found within an area of Canada where they have never been before. They may originate from another part of the country or other countries. Alien species may be introduced into, or spread throughout a new area due to:

- climate change;
- increased susceptibility of altered or degraded ecosystems;
- unintentional introductions from trade, travel and transportation pathways such as ship ballast and along roads; and
- intentional introductions.

Not all alien species pose immediate risks to ecosystems, however "invasive alien species" (IAS) do cause significant ecological, economic and environmental damage. IAS may cause harm to ecosystems and biodiversity by:

- displacing native species and/or competing with them for resources;
- degrading habitats;
- introducing diseases; and
- breeding with native species to form hybrids.

These changes to the native ecosystem are often severe, and frequently irreversible. This in turn can have a direct impact on the economy, affecting revenues generated from commercial fisheries, agriculture and tourism.

In 2004, the Government of Canada published its National Strategy on IAS (An Invasive Alien Species Strategy for Canada) in which 4 priorities were outlined: **1)** prevent new invasions; **2)** early detection of invaders should prevention fail; **3)** rapid response to new invaders; and **4)** manage established and spreading invaders. This strategy provided a foundation on which to develop complementary national, federal, provincial and territorial (FPT) action plans, strategies, legislation, and supporting partnerships.

In 2015, FPT Conservation, Wildlife and Biodiversity Ministers renewed their commitment to work towards the strategic goals of the Strategy and established an ad hoc FPT IAS Task Force. In 2016, the task force released 3 recommendations for further IAS management in Canada.

1) Improve National Leadership and Coordination of IAS Actions in Canada: formalize the FPT Invasive Alien Species Task Force.
2) Improve Emergency Response to IAS Incursions: develop a National Framework for Early Detection and Rapid Response (EDRR) Initiatives.
3) Enable Actions by Canadians: join forces to combat IAS.

INVASIVE ALIEN SPECIES (over)

INVASIVE ALIEN SPECIES (continued)

In 2017, Conservation, Wildlife and Biodiversity Ministers endorsed these recommendations and, in support of Recommendation 1, the FPT Conservation, Wildlife and Biodiversity Steering Group established a permanent FPT Invasive Alien Species National Committee.

These actions are helping Canada ensure that "by 2020, pathways of invasive alien species introductions are identified, and risk-based intervention or management plans are in place for priority pathways and species." (2020 Biodiversity Target 11)

Sources

www.canada.ca/en/environment-climate-change/services/biodiversity/invasive-alien-species-strategy.html
www.inspection.gc.ca/plants/plant-pests-invasive-species/invasive-species/eng/1328325263410/1328325333845

CANADA IN THE WORLD

Protecting Canada's wild species supports SDG 15, Life on Land. In particular, it supports the following SDG target:

Target 15.5 – Take urgent and significant action to reduce the degradation of natural habitats, halt the loss of biodiversity and, by 2020, protect and prevent the extinction of threatened species.

Work under this goal also supports progress towards the 2020 Biodiversity Goals and Targets for Canada and the global conservation objectives of the United Nations Convention on Biological Diversity, in particular, by focusing on the status of species (Canada Target 2).

CLEAN DRINKING WATER

Responsible Minister: Minister of Indigenous Services Canada (formerly Minister of Indigenous and Northern Affairs)

ALL CANADIANS HAVE ACCESS TO SAFE DRINKING WATER AND, IN PARTICULAR, THE SIGNIFICANT CHALLENGES FOR INDIGENOUS COMMUNITIES ARE ADDRESSED.

FEDERALLY, THIS CAN BE ACHIEVED BY IMPROVING PUBLIC DRINKING WATER SYSTEMS, ESPECIALLY IN FIRST NATIONS RESERVES, AND BY PLAYING A LEADERSHIP ROLE IN DRINKING WATER SCIENCE AND RESEARCH, AND THROUGH THE NATIONAL DRINKING WATER QUALITY GUIDELINES.

WHY IT'S IMPORTANT

Water is a fundamental need: for drinking, cooking, generating energy and cleaning. Along with sound management of freshwater ecosystems, access to safe water and sanitation is essential to human and ecosystem health, environmental sustainability and economic prosperity.

While Canada's drinking water is among the safest in the world, access to clean drinking water does remain a challenge in small and remote communities, such as First Nation communities on reserve. The federal government is working with First Nations communities to address drinking water needs and remove such barriers to health and safety.

ACHIEVEMENTS

TARGET

By March 31, 2019, 60% and by March 31, 2021 100% of the long-term drinking water advisories affecting First Nations drinking water systems financially supported by Indigenous Services Canada are to be resolved.

RESULT

Of the 78 long-term drinking water advisories affecting federally supported First Nations water systems in April 2016, 44% (34) were lifted as of July 2018.

When taking into account additional water systems added, 67 long-term drinking water advisories on public systems on reserve had been lifted between November 2015 and July 2018.

Progress is:

UNDERWAY – ON TRACK

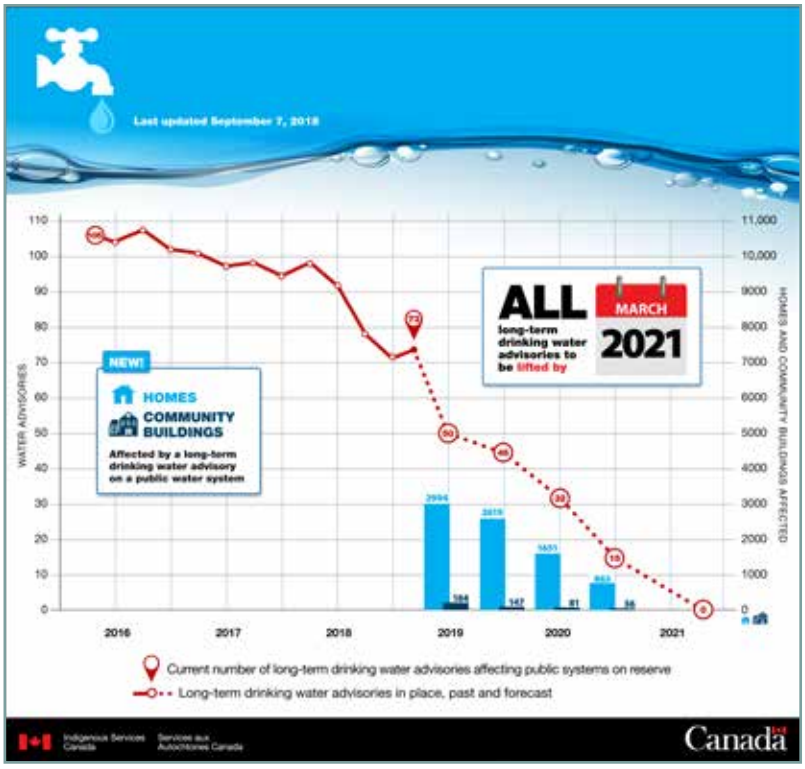
MEETING THE TARGET

Drinking water authorities need benchmarks for water quality to determine whether a drinking water management program is working. In Canada, benchmarks are provided through drinking water guidelines developed by Health Canada. These guidelines inform the testing of drinking water at various points along its journey to consumers and the determination of the safety of the water for drinking.

Since 2016, the federal government has conducted 12 public consultations on proposed new or updated drinking water quality guidelines, such as those for lead in drinking water and copper in drinking water.

There are approximately 600 First Nation communities in Canada with some larger communities that have multiple systems in place. In April 2016, about 800 water systems with 78 long-term drinking water advisories (LT-DWAs) were included in the Government of Canada's initial commitment to eliminating all long-term water advisories affecting First Nations water systems. As of July 2018, 34 (44%) of these long-term drinking water advisories were removed.

FIGURE 8. PROGRESS ON LIFTING LONG-TERM DRINKING WATER ADVISORIES ON PUBLIC SYSTEMS ON RESERVES



In January 2018, the Government of Canada expanded its commitment to eliminate LT-DWAs to include all public drinking water systems on reserve (approximately 1000 public systems). At that time, the baseline was reset to 105 LT-DWAs.

As the number of LT-DWAs on reserve is not static, these figures are updated frequently in response to changing situations. For example, since April 2016 an additional 27 advisories have become long term. The Government of Canada is on track to eliminate all LT-DWAs by March 2021. Real-time results for LT-DWAs on reserve, as well as a map of the communities affected, may be found at Indigenous Services Canada's website.

ACHIEVING THE MILESTONES

As of July 2018, 34 (or 44%) of the LT-DWAs as of April 2016 were resolved.

2018

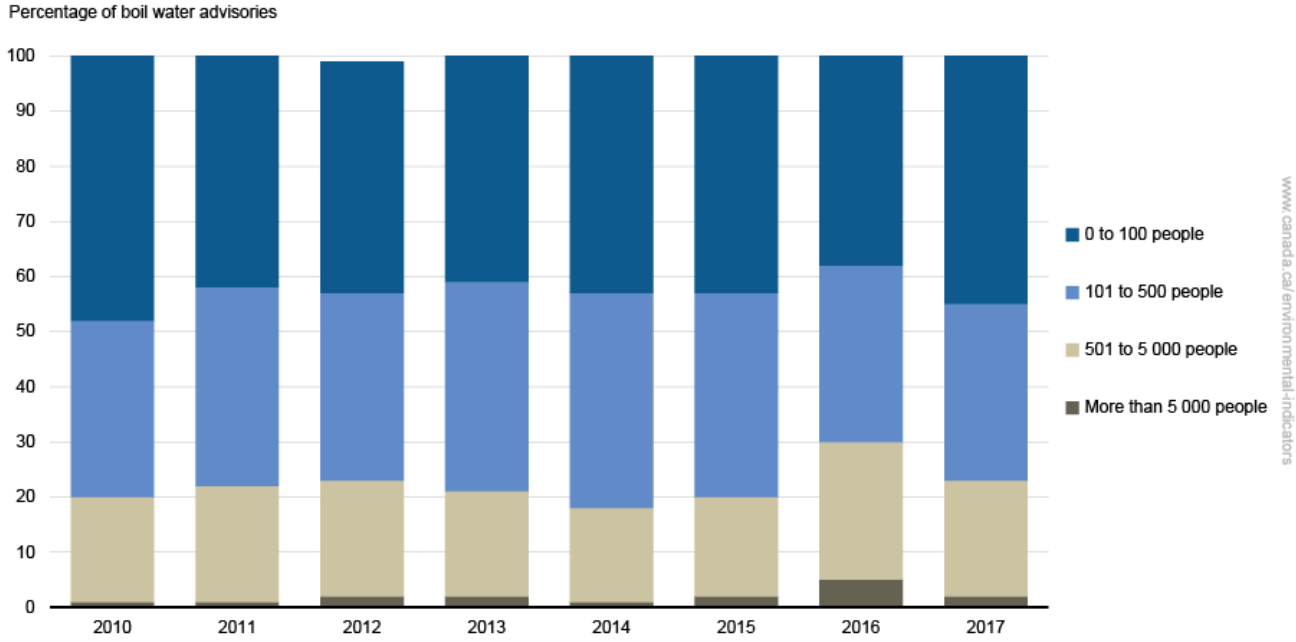
As of March 31, 2018, 3 new drinking water guidelines were endorsed by provinces and territories.

WHAT THE GOVERNMENT OF CANADA DID

In Canada, most drinking water advisories are issued as a precaution, before drinking water quality problems happen. In 2017, 83% of boil water advisories in Canada were issued on a precautionary basis due to problems with drinking water equipment or processes. Only 4% of boil water advisories were issued due to the detection of Escherichia coli (E. coli) in drinking water samples.

Drinking water advisories are more common in small communities, such as First Nations communities, due to various factors such as limited operational capacity. For example, when a water main is broken in a larger city, it is isolated and repaired quickly by well-equipped staff and there is no need for a "boil water" advisory. The same issue in a smaller community, particularly in a remote or northern community, may take longer to fix and as a result there may be a need for a drinking water advisory while repairs are being arranged and undertaken.

FIGURE 9. PERCENTAGE OF BOIL WATER ADVISORIES BY COMMUNITY SIZE



Note: Data used in this indicator come from various agencies and jurisdictions across Canada that use or share information with the Canadian Network for Public Health Intelligence's Drinking Water Advisories application. The data represent a subset (less than 50%) of the Canadian population.

Budget 2016 invested $1.8 billion over 5 years to support water and wastewater infrastructure in First Nations communities. Since then, $763.6 million has been allocated to support 463 water and wastewater projects: 108 of these were deemed completed as of Spring 2018. In all, these projects will serve approximately 444,000 people in 587 First Nation communities. Examples from specific communities follow.

- 11 advisories in place for almost 14 years in the Slate Falls First Nation were lifted. A new water treatment plant now provides clean, dependable drinking water to all residents, the Bimaychikamah Elementary School and community buildings including the health centre, nurses' residence and the First Nation's Administration Building.

- The long-term drinking water advisory affecting 295 residents in the Pic Mobert First Nation in Ontario was resolved. The community worked with Indigenous Services Canada to build a new water treatment plant.
- Upgrades and repairs to the water treatment plant for Kahkewistahaw First Nation in Saskatchewan were undertaken. Residents will have clean drinking water for the first time in more than 2 years.

RISKS AND CHALLENGES TO MEETING THE TARGET

- While progress has been made, long-term and chronic water and wastewater issues remain a recurring problem for many First Nation communities, notably those in remote areas. The challenges to improving the management of on-reserve water and wastewater infrastructure include the need for:
  - appropriate levels of funding for operations and maintenance, including water and wastewater operator salaries; and
  - stable recruitment and retention of water and wastewater operators.
- Across Canada, an on-going issue is the aging infrastructure for drinking water. Problems with equipment or processes were the primary reason behind an increase in the number of boil water advisories issued on a precautionary basis between 2010 and 2017.

PARTNERS TAKING ACTION:
WATER FIRST INTERNSHIP INDIGENOUS PILOT

On Manitoulin Island, a Water First Internship Indigenous Pilot, funded through the Indigenous Labour Market Programs to train 14 participants from 7 First Nation communities in the fields of water treatment and environmental water quality analysis has successfully concluded.

PARTNERS TAKING ACTION:
TRIBAL COUNCILS' PILOT HUB MODELS

In Ontario, Tribal Councils developed proposals to implement centralized technical support service hubs for water and wastewater infrastructure in their respective member communities. These hubs deliver services such as 24/7 remote monitoring of water treatment plants, emergency response, equipment and/or material acquisition services for emergency response, water and wastewater advisory services, technical support, oversight and mentoring to operators and public works administrators from participating First Nations.

PARTNERS TAKING ACTION:

QUEBEC CIRCUIT RIDER TRAINING PROGRAM

The Quebec Circuit Rider Training Program helps foster pride amongst First Nations water and wastewater operators. The program identifies training gaps by holding a friendly competition called the "Eaux-lympiades" at their annual conference. Operators compete in teams. Community leaders are invited to the awards ceremony at the end of the conference to recognize and celebrate their operators.

CANADA IN THE WORLD

Ensuring safe drinking water for all Canadians supports SDG 3 Good Health and Well-being, and SDG 6 Clean Water and Sanitation.

Target 3.9 – By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

Target 6.1 – By 2030, achieve universal and equitable access to safe and affordable drinking water for all.

Target 6.3 – By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.

Target 6.b – Support and strengthen the participation of local communities in improving water and sanitation management.

SUSTAINABLE FOOD

Responsible Ministers: Minister of Agriculture and Agri-Food; Minister of Health; Minister of Fisheries, Oceans and the Canadian Coast Guard

INNOVATION AND INGENUITY CONTRIBUTE TO A WORLD-LEADING AGRICULTURAL SECTOR AND FOOD ECONOMY FOR THE BENEFIT OF ALL CANADIANS.

THE GOVERNMENT OF CANADA IS ADVANCING ITS GOAL OF PROMOTING SUSTAINABLE FOOD PRACTICES AND REMAINING A WORLD-LEADER IN THE AGRICULTURAL SECTOR AND FOOD ECONOMY. THE FEDERAL GOVERNMENT IS DOING THIS THROUGH A NEW PARTNERSHIP-BASED STRATEGY FOR ANIMAL AND PLANT HEALTH, BY ADDING AN INNOVATION AND SUSTAINABLE GROWTH COMPONENT IN THE UPDATED FEDERAL, PROVINCIAL AND TERRITORIAL AGRICULTURE POLICY FRAMEWORK, AND ALSO THROUGH IMPROVED REPORTING ON THE MANAGEMENT OF MARINE RESOURCES.

WHY IT'S IMPORTANT

Canada's agriculture, aquaculture and fisheries provide safe, secure and healthy food for Canadians.

Using farm equipment, fertilizers and raising livestock (such as cattle and sheep) emit greenhouse gases (GHGs). Employing sustainable practices, such as no-till farming, precision agriculture and feeding technologies help to store carbon in soil, reduce GHG emissions, and protect soil and water resources.

Canada's food supply must also be secure from diseases, pests and invasive alien species that threaten animal health and plant resources.

The food system contributes significantly to the Canadian economy. In 2016, the agriculture and agri-food sector generated over $110 billion, or close to 7% of Canada's gross domestic product and employed 2.3 million Canadians.

Over the long term, efforts to conserve coasts and oceans, reduce water pollution, and improve and conserve soils are essential to ensuring that Canada's food system maintains its capacity to feed Canadians and provide jobs.

ACHIEVEMENTS

TARGET	**Ensure a safe and accessible food supply by mitigating risks to animal and plant resources from pests, diseases and other health hazards and prevent risks to the health of Canadians.**	**Progress is:** **UNDERWAY – ON TRACK**
RESULT	**Federal, provincial and territorial Ministers of Agriculture endorsed the partnership-based Plant and Animal Health Strategy for Canada in July 2017.**	
TARGET	**By 2020, all aquaculture in Canada is managed under a science-based regime that promotes the sustainable use of aquatic resources (marine and freshwater) in ways that conserve biodiversity.**	**Progress is:** **UNDERWAY – ON TRACK**
RESULT	**From 2015 to 2016, 100% of inspected aquaculture operations complied with *Fisheries Act* regulations.**	

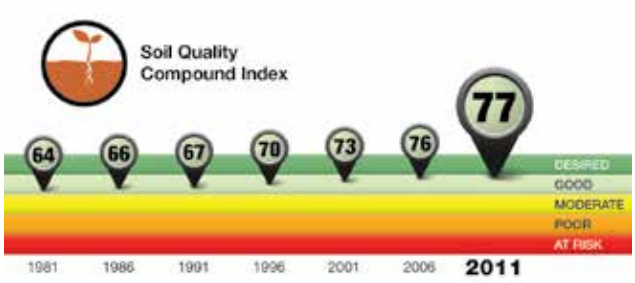
ACHIEVEMENTS

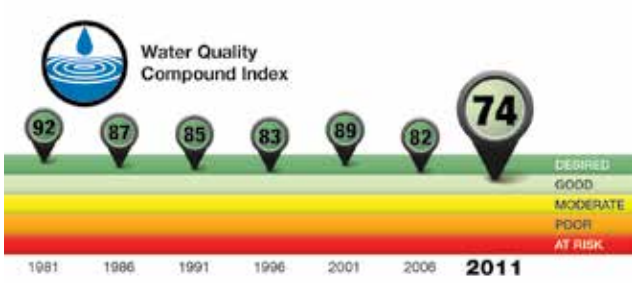
TARGET	**By 2030, agricultural working landscapes provide a stable or improved level of biodiversity and efficient management towards water and soil quality for food production.**	**Progress is:**
RESULT	The most recent data available was released in 2016 and covered the 1981 to 2011 time period. This data shows an improving trend in soil quality and a declining trend in water quality. Between 1996 and 2011, wildlife habitat capacity remained stable on 85% of Canadian farmland, improved on 1% and decreased on 14% of farmland.	**NO NEW DATA. NEXT DATA RELEASE IS EXPECTED IN 2021**
	Adoption of beneficial management practices by Canadian farmers grew over the 2016-17 time period.	**UNDERWAY – ON TRACK**

MEETING THE TARGETS

Soil and water quality data were last published in 2016, covering the period between 1981 and 2011. The soil quality data showed an improving trend that is likely due to the increased adoption of low-till practices on the prairies, an example of a beneficial management practice.

As for water quality, the most recent data indicates a slight decline. This is attributed to factors such as increased fertilizer use and increased livestock concentration, compounded by record rainfall in the prairies during 2011, the last year data was collected.





The Wildlife Habitat Capacity (WHC) indicator for agricultural lands is one measure of the land's capacity to support biodiversity. Between 1996 and 2011, WHC remained stable on 85% of Canadian farmland, improved on 1%, and decreased on 14% of farmland.

The loss of natural and semi-natural land cover and the intensification of agricultural operations resulted in a small but measurable decline in average national habitat capacity on farmland from 1986 to 2011. Most of these declines occurred in southern Ontario and Quebec following a reduction in pasture and hay land, and dramatic increases in soybean production. The Prairies, which account for the majority of Canada's agricultural lands, have had pockets of decline, but have remained stable in terms of their ability to support wildlife habitat.

Provinces and territories reported in 2016-17 that through federal-provincial-territorial cost-shared programs, farmers adopted 19,083 beneficial management practices on their lands, far exceeding the target of 17,600 that federal, provincial and territorial governments set for March 2019.

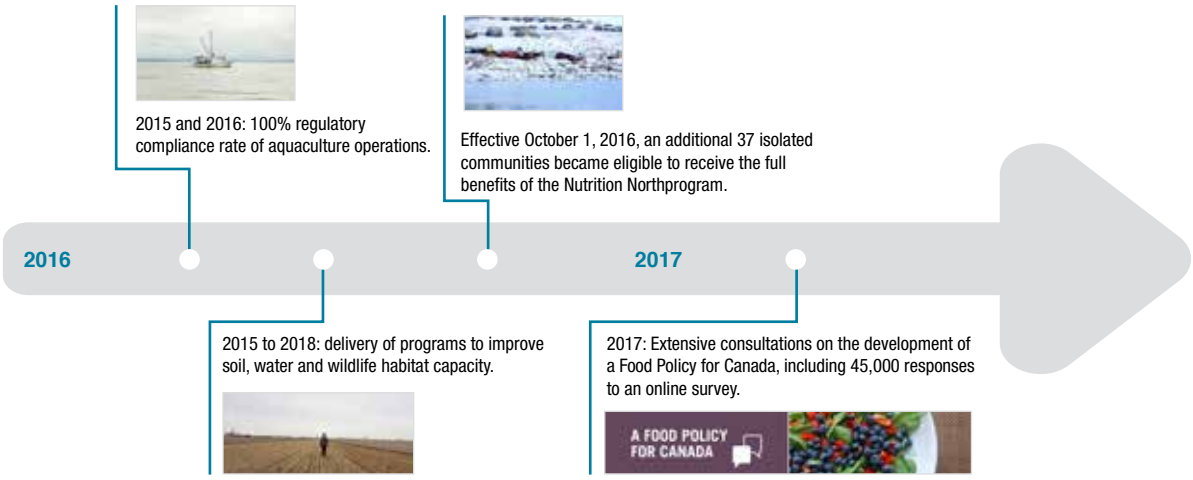
A beneficial management practice is any agricultural management practice which:

- ensures the long-term health and sustainability of land-related resources used for agricultural production;
- positively impacts the long-term economic and environmental viability of agricultural production; and
- minimizes negative impacts and risks to the environment.

As with agriculture, aquaculture management in Canada is a shared responsibility between the federal and provincial governments. In June 2015, the *Aquaculture Activities Regulations* (AAR) came into effect. These regulations increase federal government oversight, requiring private aquaculture operations to report data on, for example, the type and quantities of drugs and pesticides used to treat diseases and pests.

In 2016, the federal government began collecting data annually under the authority of these regulations. Current compliance rates with the environmental protection standards set out in the *Fisheries Act* regulations are very high: there were no charges for violations in 2015 and 2016. In previous years, the violations, although few, related to the illegal transportation of species, illegal use of a pesticide, and violation of the licence condition setting the maximum amount of biomass allowed on the licensed site.

ACHIEVING THE MILESTONES



WHAT THE GOVERNMENT OF CANADA DID

The Government of Canada continues to emphasize the importance of sustainable food: food that is produced in ways that are good both for humans and for the environment.

As a means to support a safe and accessible food supply, federal, provincial and territorial Ministers of Agriculture endorsed the partnership-based Plant and Animal Health Strategy for Canada in July 2017. This strategy covers the agriculture, forestry, aquaculture and apiculture sectors with a focus on risk prevention and collaboration among governments, industry, academia and other partners to support work on animal and plant health.

MITIGATING RISKS TO PLANT RESOURCES

The Plant and Animal Health Strategy has 4 key objectives:

- control risk at critical entry points, such as, borders, farms and processing facilities;
- provide access to accurate and timely information to inform action;
- prepare to respond to, and recover from, plant- and animal-related emergencies; and
- enable all parties to carry out actions in a coordinated and timely manner.

The Government of Canada, together with its partners, continues to identify ways to stop plant pests from entering Canada through pathways such as e-commerce deliveries, in sea containers, and other introduction and dispersal routes, by:

- using education, best practices, international collaboration and regulations to stop the introduction and spread of pests;
- developing and continuing to implement guidance about sea containers used for international transport of traded or personal goods to ensure these do not introduce and spread plant pests; and

- starting a process to review equally effective but safer alternatives to methyl bromide. This chemical is used as a quarantine treatment against a wide variety of plant pests which, although an effective fumigant, has negative environmental impacts when released to air.

AGRICULTURE AND AQUACULTURE SECTORS

In April 2018, the Canadian Agricultural Partnership came into effect. It is a 5-year, $3 billion investment by federal, provincial and territorial governments to strengthen the agriculture, agri-food and agri-based products sector. The Partnership assists farmers in adapting to climate change, conserving water and soil resources, and sustainably growing their businesses to meet increasing global food demand.

In May 2018, the first dataset collected under the *Aquaculture Activities Regulations* (AAR) was published. Aquaculture reporting provides publicly available data and information on the environmental sustainability and performance of Canada's aquaculture sector.

In 2018, the Government of Canada announced renewed funding for the Sustainable Aquaculture program ($22 million over 2 years) to continue progress towards implementing a science-based Aquaculture Management regime by 2020.

INTERNATIONAL ENGAGEMENT

There is also continued engagement and cooperation with international trading partners and standard setting organizations, such as the International Plant Protection Convention, North American Plant Protection Organization and Quadrilateral Plant Health countries. In addition, there is on-going work on risk assessment, research, science and technology, education and outreach, and the development of new partnerships to efficiently protect Canada's plant resources.

THE FOOD ECONOMY

Nutrition North Canada (NNC) is a Government of Canada subsidy program to provide Northerners in isolated communities with improved access to perishable nutritious food through a retailer subsidy that is passed on to consumers. In 2016-17, Nutrition North Canada provided $69.7 million for food subsidies, 27.7 million kg of food were subsidized, and 96% of the food subsidy was spent on perishable, nutritious food.

In 2016, a point-of-sale system was made mandatory for NNC registered retailers across the North. This new system provides greater transparency and accountability, allowing customers to see on their grocery receipt how and when the subsidy is applied. Culturally-appropriate retail and community-based nutrition education initiatives are also offered through this program to help improve knowledge of healthy eating and develop skills in the selection and preparation of healthy foods.

RISKS AND CHALLENGES TO MEETING THE TARGETS

- The impact of invasive alien species (IAS) on agricultural areas is severe and often irreversible (see box in Healthy Wildlife Populations chapter). Controlling IAS is expensive, and eliminating these species is seldom possible: prevention is the most cost-effective way to manage this risk.
- Ongoing efforts are required to minimize pressures on the environment from agriculture, such as habitat loss and degradation, water pollution and GHG emissions. Efforts in these areas will not only minimize pressures on the environment but can also lead to other benefits, such as improved soil quality and increased productivity of agricultural lands.
- Some Canadians still do not have easy access to affordable, nutritious food, especially those living in isolated northern communities for whom the supply of traditional and country foods are affected by climate change and the depletion of local natural resources.
- Food waste is a problem in Canada. In addition to being a waste of the land, water and soil resources used to produce food that is not ultimately eaten, it creates methane emissions in landfills, which are estimated to contribute almost 2% to Canada's total GHG emissions.

PARTNERS TAKING ACTION: PROVISION COALITION – SUSTAINABLE FOOD MANUFACTURING

Provision Coalition is Canada's premier food and beverage manufacturer sustainability organization. At Provision, the latest sustainability advances, tools and resources are shared with food and beverage manufacturers across the country.

A recipient of federal funding through the Canadian Agricultural Partnership, Provision makes it easier for manufacturers to understand their sustainability challenges and implement sound business solutions. Provision offers programs for manufacturers to improve their sustainability performance in areas such as food loss and waste reduction and sustainable business strategy development. In addition, their award-winning Sustainability Management System (SMS) is home to a suite of globally recognized and award winning tools, resources and information.

PARTNERS TAKING ACTION: SENTIER URBAIN

Sentier Urbain is a non-profit organization with a mission to green urban spaces for the welfare of society. Its actions are aimed at mobilizing local communities to involve them in urban agriculture activities such as tree planting, which the organization refers to as "social greening." In 2017, Sentier Urbain received the City of Montreal's Agir ensemble award, for its work on the biodiversity and pollinating garden located on the lands surrounding the Jacques Cartier Bridge. The Jacques Cartier and Champlain Bridges Incorporated is a proud collaborator with Sentier Urbain for over 8 years.

CANADA IN THE WORLD

Contributing to a world-leading agricultural sector and food economic for the benefit of all Canadians supports SDG 2.

Target 2.4 – By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality.

Work under this goal also supports progress towards the 2020 Biodiversity Goals and Targets for Canada and the global conservation objectives of the United Nations Convention on Biological Diversity, in particular, by promoting biodiversity on working landscapes (Canada Target 7) and by improving aquatic resource management (Canada Target 8).

CONNECTING CANADIANS WITH NATURE

Responsible Minister: Minister of Environment and Climate Change

CANADIANS ARE INFORMED ABOUT THE VALUE OF NATURE, EXPERIENCING NATURE FIRST HAND, AND ACTIVELY ENGAGED IN ITS STEWARDSHIP.

BY INCREASING VISITS TO NATIONAL PARKS AND MARINE CONSERVATION AREAS, AND ENCOURAGING CANADIANS TO ACTIVELY PROTECT THE ENVIRONMENT, THE GOVERNMENT OF CANADA SUPPORTS OPPORTUNITIES FOR CANADIANS TO BETTER CONNECT WITH NATURE.

WHY IT'S IMPORTANT

Connecting with nature is good for Canadians, their communities and the environment. Spending time in nature is known to improve physical and mental health, and support child development. Encouraging Canadians to spend time in nature also generates significant economic benefits through nature-based tourism.

As Canadians visit and use parks and green spaces, and experience their beauty, many are motivated to help with the work of protection and conservation.

ACHIEVEMENTS

TARGET

By 2020, maintain or increase the number of Canadians that get out into nature and increase participation in biodiversity conservation activities relative to a 2010 baseline.

RESULT

In 2017-18, visits to national parks and marine conservation areas increased 34% from 2010-11. An increased percentage of Canadian households also reported that they had visited a nearby park or greenspace. Almost one-fifth of Canadian households reported that they continued to actively protect the environment.

Progress is:

UNDERWAY – ON TRACK

MEETING THE TARGET

By expanding opportunities to experience nature, the federal government is supporting the ability of Canadians to connect with nature and become involved in conservation.

Progress towards this target is measured by the number of visits to national parks and national marine conservation areas and the number of Canadian households with access to a park or green space close to home, who also visited that park or green space. The target also takes into account the number of Canadian households who volunteer to conserve and protect the environment and wildlife.

DID YOU KNOW …

16.8 million people visited national parks and national marine conservation areas in 2017-18.

Canada's 150th anniversary of Confederation (2017) was a banner year with visits to national parks and national marine conservation areas in 2017-18 up 9% over visits in 2016-17, and 34% over visits in 2010-11.

An increased percentage of Canadian households reported that they had visited a nearby park or greenspace (87% in 2015 compare to 85% in 2013).

Despite a slight reduction in participation levels from 2011 to 2015, 17% of Canadian households reported that they took action to protect the environment, such as by volunteering to clean up, monitor or assess shorelines, and, by sharing knowledge about wild species or natural habitats.

FIGURE 10. ANNUAL VISITATION TO NATIONAL PARKS AND NATIONAL MARINE AREAS

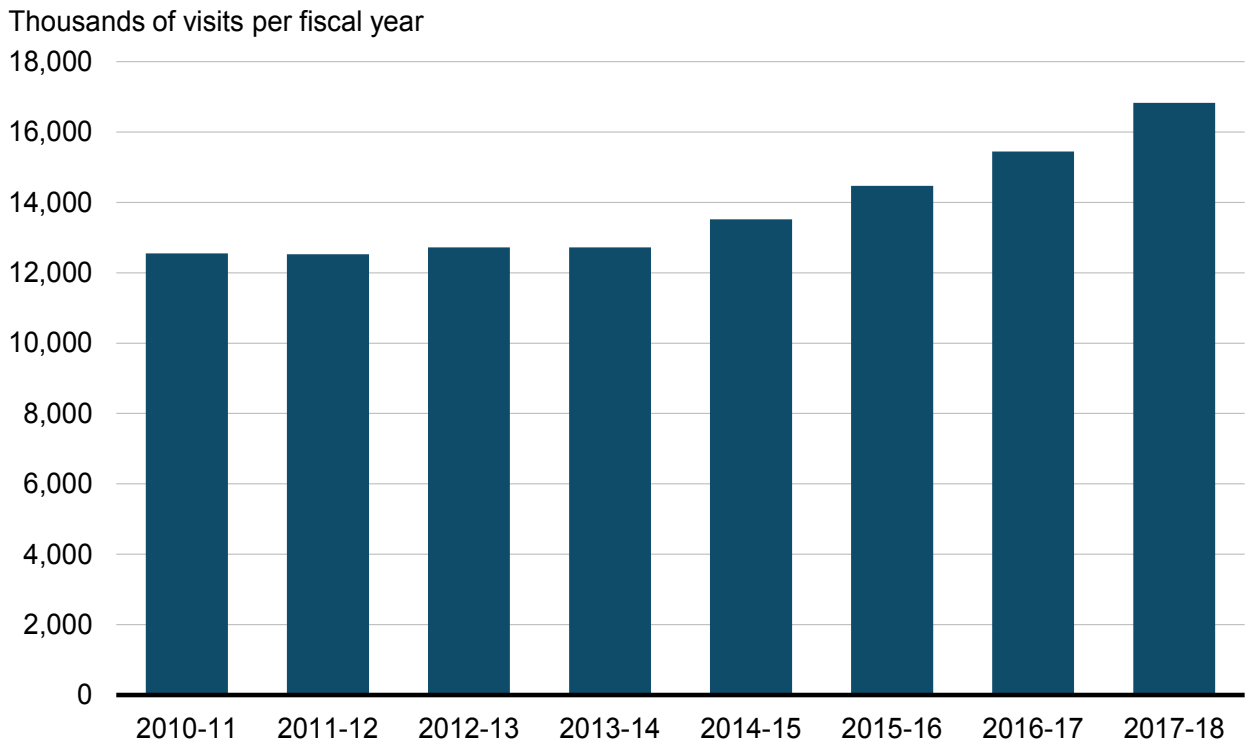


FIGURE 11. PERCENTAGE OF CANADIAN HOUSEHOLDS THAT VISITED A PARK OR GREENSPACE CLOSE TO HOME

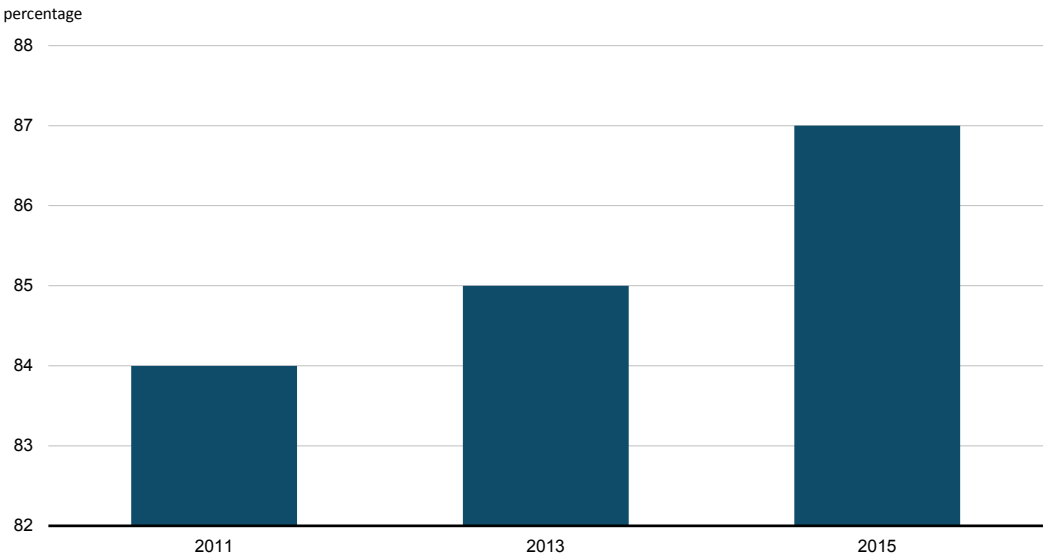
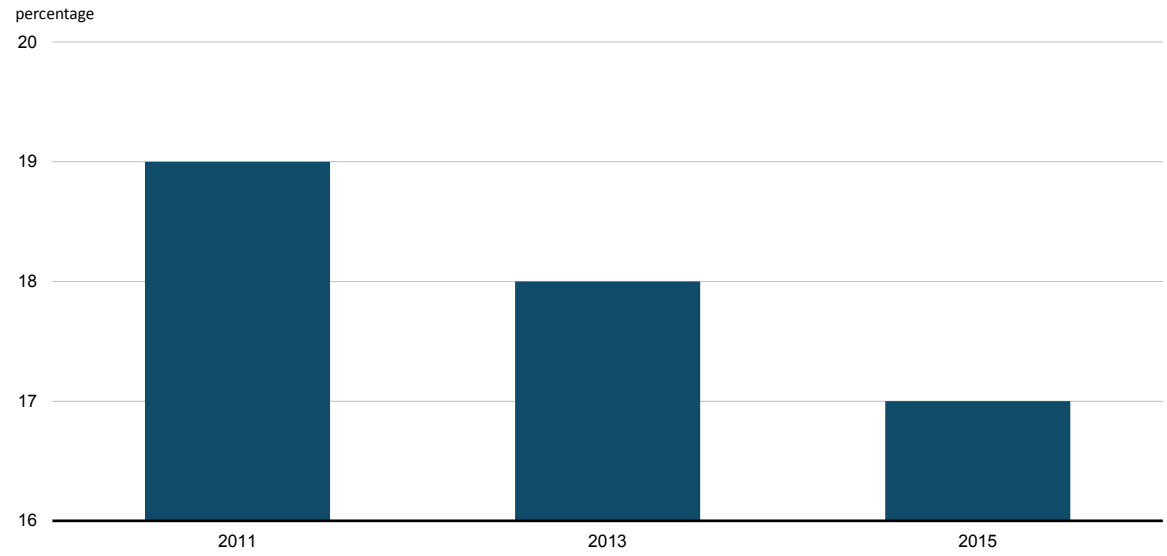
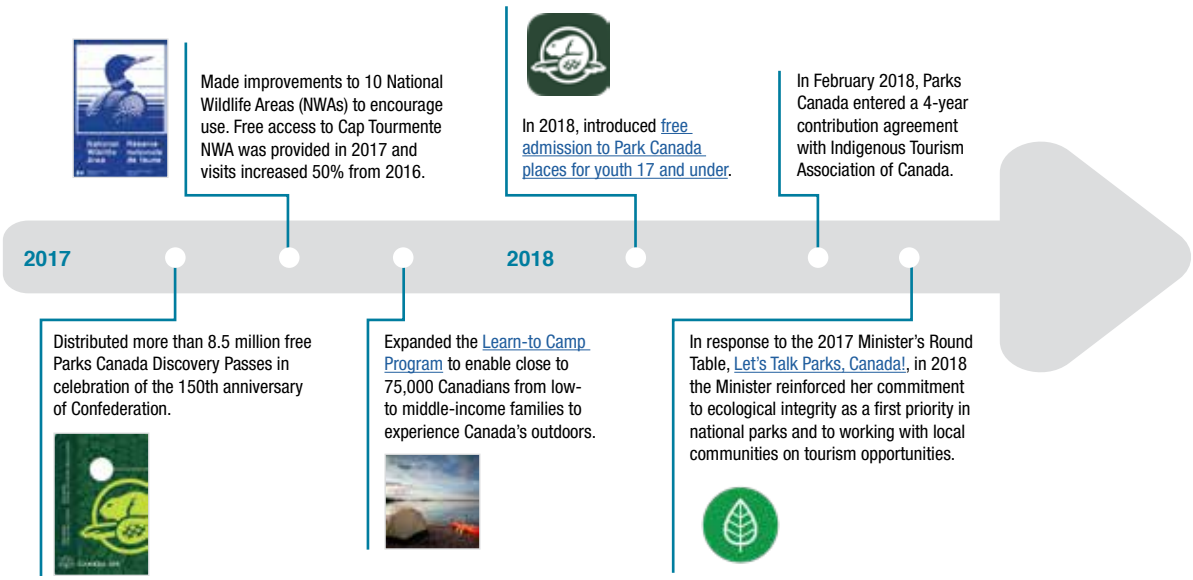


FIGURE 12. PERCENTAGE OF CANADIAN HOUSEHOLDS ENGAGED IN VOLUNTARY CONSERVATION ACTIVITIES



ACHIEVING THE MILESTONES



WHAT THE GOVERNMENT OF CANADA DID

More Canadians have been getting out into nature and volunteering to conserve and protect the environment with help of a wide range of initiatives. Over the past 2 years, the Government of Canada provided for:

- free admission for new Canadian citizens to national parks, national marine parks and national historic sites to support greater appreciation of nature and the need to protect it through continued partnership with the Institute for Canadian Citizenship;
- improved accessibility and overall visitor experience in national sites by renewing bike and walking trails, and improving infrastructure of heritage buildings, visitor centres, waterways and highways;
- initiated projects with Indigenous partners to support better decision making about protecting and connecting with natural and cultural environments, and exploring Canadian history; and
- funding of $1.7 million to Earth Rangers (2016 to 2018), a non-profit organization focused on educating and engaging school-aged children across Canada in wildlife conservation. An "Earth Rangers" school assembly was delivered to nearly a quarter million Canadian children in 2017-18.

The Government of Canada also invested more than $3 million between 2014 and 2016 in 10 selected National Wildlife Areas (NWAs) to help Canadians connect with nature. Canada's 54 NWAs protect approximately 1 million hectares of nationally significant terrestrial and marine habitats.

In Budget 2017, the Government of Canada announced investments of approximately $3.6 billion, including an additional $364 million to renew infrastructure assets as well as $30 million in funding for the Great Trail.

ROUGE NATIONAL URBAN PARK

Once fully established, the Rouge will be one of the largest and best protected urban parks of its kind in the world: 19 times larger than Vancouver's Stanley Park, and 23 times bigger than New York's Central Park. Spanning 79.1 square kilometres in the heart of Toronto's metropolitan area and accessible to 7 million people by car, transit or free shuttle, the Rouge provides unprecedented opportunities to experience nature. The *Rouge National Urban Park Act*, amended in 2017, safeguards both the ecological integrity of the park and the rights of the park farmers to provide local food as they have been doing for the past 2 centuries.

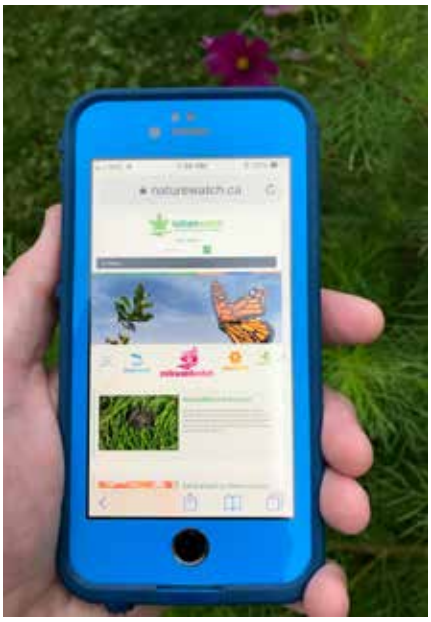
RISKS AND CHALLENGES TO MEETING THE TARGET

- Climate change and other environmental factors impact progress towards achieving the target. The risks to the delivery of programs and services for Canadians to experience their national parks include:
  - invasive species within national parks impact biodiversity and detract from the visitor experience (see Healthy Wildlife Populations chapter); and
  - extreme weather impacts park infrastructure, such as roads and bridges, putting the delivery of programs and services at risk.
- More work needs to be done to facilitate Indigenous connections with traditionally-used lands and waters, and to increase the number of cooperative management structures with decision-making roles for Indigenous partners.

PARTNERS TAKING ACTION: NATUREWATCH

The NatureWatch program, a citizen-based monitoring program, allows Canadians all over the country to help researchers improve scientific knowledge of changes in Canada's biodiversity, climate, and the natural environment. NatureWatch is an umbrella for several citizen-based monitoring programs including FrogWatch, IceWatch, PlantWatch, Wormwatch, and the recently launched MilkweedWatch.

Since 2014, the program has significantly expanded its reach, engaged new partners and launched various collaborations and activities including partnerships with the National Hockey League, eco-tourism companies, Inuit youth groups, primary school teachers, Scouts Canada and the Canadian Museum of Science and Technology. In 2017, the federal government joined NatureWatch, the University of Ottawa, Wilfrid Laurier University, Nature Canada and the David Suzuki Foundation in this popular program.



CANADA IN THE WORLD

Ensuring Canadians are informed about the value of nature supports SDG 11 Sustainable Cities and Communities and Goal 12 Responsible Consumption and Production.

Target 11.4 – Strengthen efforts to protect and safeguard the world's cultural and natural heritage.

Target 12.8 – By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature.

Work under this goal also supports progress towards the 2020 Biodiversity Goals and Targets for Canada and the global conservation objectives of the United Nations Convention on Biological Diversity, in particular, by encouraging Canadians to get involved in biodiversity conservation activities (Canada Target 19).

SAFE AND HEALTHY COMMUNITIES

Responsible Ministers: Minister of Environment and Climate Change; Minister of Health

ALL CANADIANS LIVE IN CLEAN, SUSTAINABLE COMMUNITIES THAT CONTRIBUTE TO THEIR HEALTH AND WELL-BEING.

THIS CAN BE ACHIEVED THROUGH THE REDUCTION OF AIR POLLUTANTS SUCH AS FINE PARTICULATE MATTER, NITROGEN OXIDES AND VOLATILE ORGANIC COMPOUNDS THAT CAN BE INHALED. ENSURING PROPER REGULATION OF CHEMICALS THAT MAY ADVERSELY AFFECT HUMAN HEALTH OR ENVIRONMENTAL VITALITY IS ALSO ESSENTIAL TO ENSURING COMMUNITIES ARE SAFE. WHERE THE ENVIRONMENT HAS BEEN CONTAMINATED, REMEDIATION IS A PRIORITY FOR THE GOVERNMENT OF CANADA.

WHY IT'S IMPORTANT

Air pollution is a significant global risk to human health and the environment. Even at low levels, air pollution can impact health, especially among children, the elderly and those with health conditions.

Air pollution also has economic costs: lost productivity, increased need for medical care, and an impaired quality of life. An estimated 14,400 premature deaths per year in Canada can be linked to air pollution from human activity, and about 30% of Canadians live in areas where air quality does not always meet the Canadian Ambient Air Quality Standards (CAAQS).

While chemicals are part of everyday life and provide many benefits, they can enter the air, water, and soil, harming ecosystems and the health of Canadians if they are not properly managed.

For the federal government, there are also currently 5066 contaminated sites that are "active": identified sites where remedial action is, or may be required. In addition, there are 1983 sites suspected of being contaminated.

Source: Canadian Council of Ministers of the Environment (CCME) 2017 State of the Air report.

Safe and healthy communities are those that are clean, sustainable and support health and well-being. A clean community is one that is free from toxic pollutants, has clean water and sustainable food, and promotes economic growth within a healthy local environment.

ACHIEVEMENTS

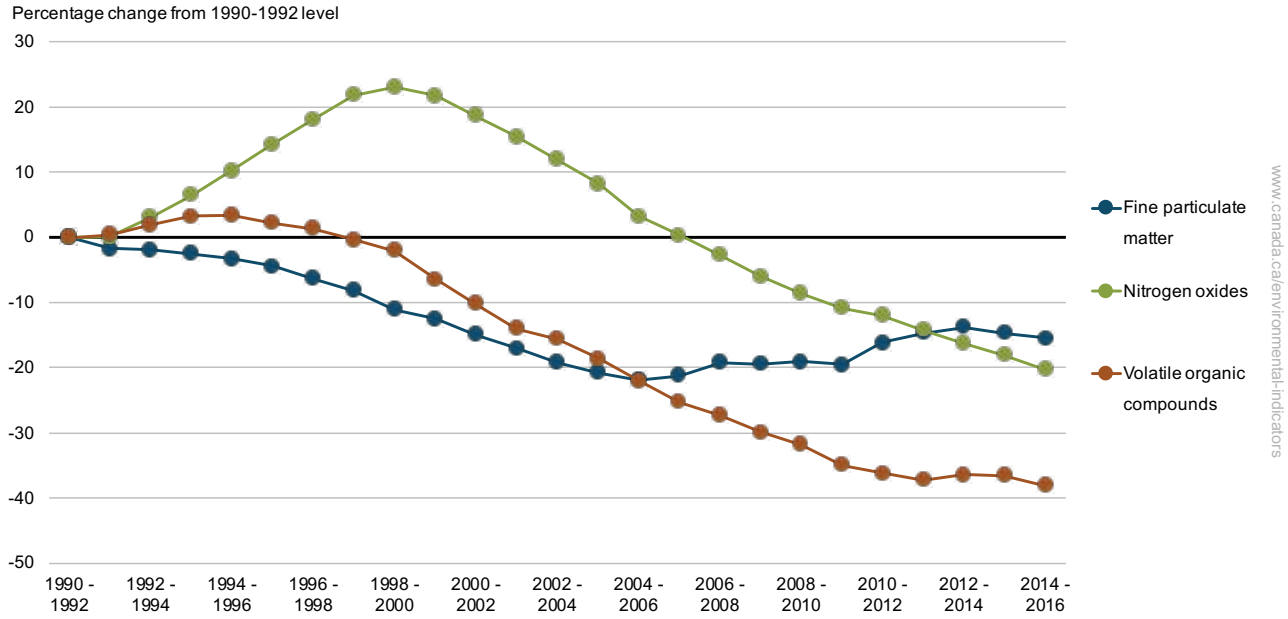
TARGET	**Implement the Air Quality Management System to: decrease the 3-year average of fine particulate matter, nitrogen oxides and volatile organic compound emissions from regulated and/or targeted sources to below the previous 3-year average.**	
RESULT	The Air Quality Management System is being implemented. Emissions of fine particulate matter, nitrogen oxides and volatile organic compounds decreased by about 0.9%, 2.8% and 2.5% in the most recent 3-year average (2014 to 2016) as compared with the previous one (2013 to 2015). Emissions of sulphur oxides (SOx), nitrogen oxides (NOx), volatile organic compounds (VOCs) and carbon monoxide (CO) were 18% to 65% lower in 2016 than in 1990.	Progress is: **UNDERWAY – ON TRACK**
TARGET	**Implement the Air Quality Management System to: increase the percentage of the Canadian population living in areas where measured outdoor concentrations are below the Canadian Ambient Air Quality Standards (CAAQS) for fine particulate matter and ozone compared to the year 2007.**	Progress is: **UNDERWAY – ON TRACK**
RESULT	The Air Quality Management System is being implemented. The percentage of Canadians living in areas with fine particulate matter, ozone, sulphur dioxide, and nitrogen dioxide levels below CAAQs increased from 60% in the reporting year 2007 to 70% in the reporting year 2015.	
TARGET	**By 2020, address the 4300 substances identified as priorities for action under the Chemicals Management Plan.**	Progress is: **UNDERWAY – ON TRACK**
RESULT	As of March 31, 2018, the Government of Canada has addressed 3470 (80%) of the 4363 chemicals identified as priorities for attention by 2020-21.	

MEETING THE TARGETS

Overall, Canadian emissions of most major air pollutants are declining and data from 2016 continues to show a general downward trend. The 3 main targets for this goal – decreased emissions, decreased exposure to, air pollutants and action against harmful chemicals – remain on track for meeting Canada's goals in these areas.

The most recent data on emissions of fine particulate matter, nitrogen oxides, and volatile organic compounds indicate decreases of approximately 0.9%, 2.8% and 2.5% in the most recent 3 year average (2014 to 2016) as compared with the previous one (2013 to 2015).

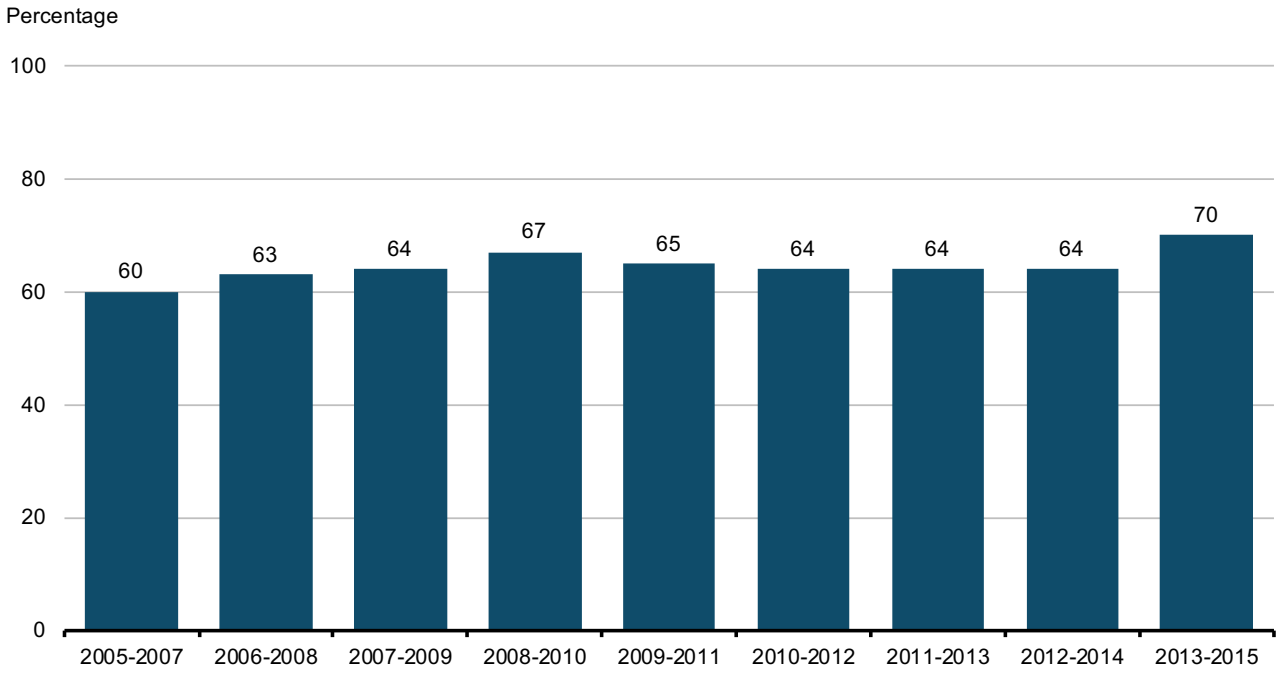
FIGURE 13. PERCENTAGE CHANGE FROM 1990-1992 IN THE 3 YEAR ROLLING AVERAGE OF EMISSIONS LEVELS OF FINE PARTICULATE MATTER, NITROGEN OXIDES AND VOLATILE ORGANIC COMPOUNDS



Over the most recent reporting period (2013 to 2015), approximately 70% of Canadians were living in areas where outdoor pollution levels for fine particulate matter, ozone, sulphur dioxide, and nitrogen dioxide were below the Canadian Ambient Air Quality Standards. This is an improvement from the 2005 to 2007 base year value of 60%.

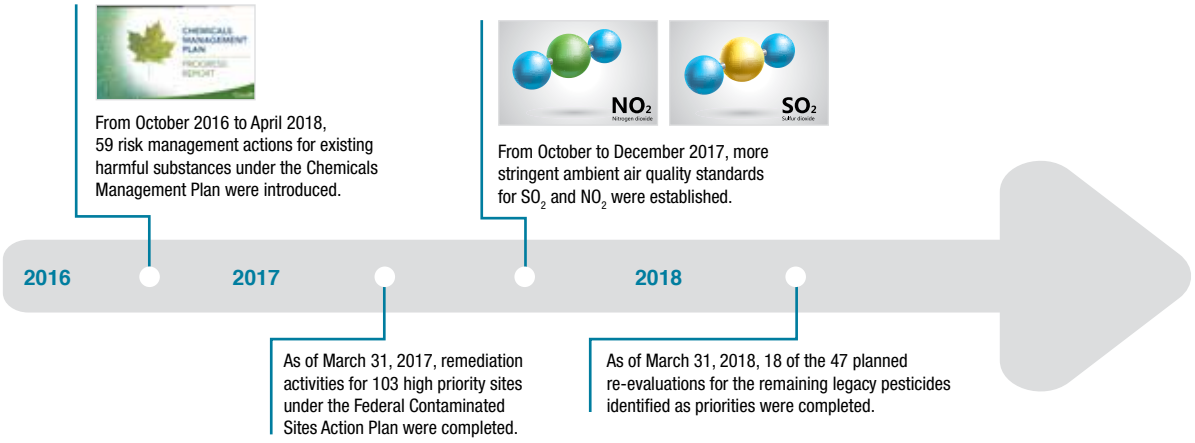
Some regions of the country, however, still exceed the CAAQS. This was the case for fine particulate matter in the interior of British Columbia, Georgia Strait, central Alberta and southern Quebec over 24-hour time periods. Peak ozone was evident in southern Quebec and southern Ontario over 8-hour periods.

FIGURE 14. PERCENTAGE OF THE CANADIAN POPULATION LIVING IN AREAS WHERE MEASURED OUTDOOR CONCENTRATIONS ARE BELOW THE CAAQS



The Canadian Ambient Air Quality Standards (CAAQS) use 3-year rolling average. For this reason the bar chart portrays one percentage number for each 3-year average.

ACHIEVING THE MILESTONES



WHAT THE GOVERNMENT OF CANADA DID

Federal, provincial and territorial governments continued to collaborate on implementing the Air Quality Management System (AQMS). This system provides ambient or outdoor air quality standards for key pollutants and tracks actions taken to reduce emissions from significant sources of air pollution.

Concentrations of harmful substances in humans and in the environment, and releases of chemicals into the air, land and water are also monitored using the Canadian Health Measures Survey and the National Pollutant Release Inventory.

Funding provided in Budgets 2016 and 2017 is helping to address air pollution through science and policy initiatives, as well as mitigation actions for both outdoor and indoor air quality.

- Budget 2016: $340.5 million (2016 to 2021) and $48.5 million ongoing.
- Budget 2017: $201.04 million (2018 to 2023) and $48.96 million ongoing.

The Government of Canada worked with the Canadian Council of Ministers of the Environment (CCME) to publish a 2017 State of the Air Report. This report provides information on the Air Quality Management System, air quality across Canada, air pollution and its effects, and actions to improve the air that Canadians breathe.

The *Multi-sector Air Pollutants Regulations* (MSAPR), designed to reduce air pollution from industrial boilers and heaters, cement manufacturing, and stationary engines, were published in June 2016. The reductions of nitrogen oxides emissions expected from the MSAPR in its first 19 years are the equivalent of taking all passenger cars and trucks in Canada off the road for about 12 years.

Between May 2016 and January 2018, guidelines were published for stationary combustion turbines, as well as codes of practice, performance agreements, and/or pollution prevention planning notices for various sectors. The sectors included aluminum, iron, steel and ilmenite, iron ore pellets, potash and base-metals smelting.

Air pollutant standards for vehicles, locomotives and fuels were developed and enforced, and regulations developed to limit harmful emissions from consumer and commercial products including:

- a Code of Practice for Asphalt was published in February 2017 to limit VOCs;
- regulatory amendments were published in 2017 that will strengthen smog-forming emission standards for small engines, such as lawnmowers;
- the fuels regulatory implementation program has undertaken an enhanced compliance; verification program that includes sampling at various locations in Canada;
- inspections took place at 5% of the regulated companies in 2017-18; and
- annual reports are reviewed, and when exceedances are reported, they are referred to the enforcement officials.

In March 2018, the Air Quality Health Index (AQHI) extended coverage to 28.2 million Canadians (80% of the population) in 10 provinces and 2 territories. An AQHI App was also developed in partnership with the Government of Alberta to provide current observations, forecasted air quality, and alerts for when the AQHI reaches individual “trigger” levels.

Through the Chemicals Management Plan (CMP), the Government of Canada assesses chemicals used in Canada and takes action to manage those that are harmful to human health or the environment. These assessments enable the Government of Canada to identify whether or not controls are needed, and if so, the type of control best suited for reducing or preventing the potential harm to Canadians and the environment.

As of March 31, 2018, of the 4363 substances identified as priorities for attention through the CMP, 3470 substances (80%) have been assessed for risks they may pose to Canadians and their environment.

In addition, public outreach activities continued to inform Canadians about reducing the risks from chemicals used in and around the home. For example, the Hazardcheck pamphlet shows ways for Canadians to improve indoor air quality, such as testing for radon, removing and preventing mold, and ventilating during renovations and while cooking.

Budget 2015 announced $1.35 billion over 4 years (2016 to 2020) for Phase III of the Federal Contaminated Sites Action Plan, including $1.25 billion for remediation activities on the highest priority federal contaminated sites, and $99.6 million for assessment and program management activities. Additional funding of $217 million in Budget 2016 has served to accelerate these activities. Progress at specific sites across Canada is ongoing (see: Federal Contaminated Sites Action Plan). Regarding the remediation of the highest priority sites, 612 sites will be remediated across Canada between 2016 and 2020 with 103 already completed as of March 2017.

AIR QUALITY HEALTH INDEX

The AQHI is a scale designed to help understand what the local air quality means, so that individuals can make informed decisions about protecting their health by limiting their short-term exposure to air pollution and adjusting activity levels during periods when levels of air pollution are elevated.

RISKS AND CHALLENGES TO MEETING THE TARGETS

AIR QUALITY

- While most major air pollutants from Canadian sources are declining, reducing air pollution still remains a challenge, especially:
  - where there is high vehicle traffic, industrial activity, or concentrated livestock production;
  - in communities where wood-burning stoves and fireplaces are common, causing higher levels of fine particulate matter to be released; and
  - where more frequent wildfires in forests and grasslands are occurring (climate change increases the risk for these events).
- Air quality is also affected by pollutants originating from beyond our borders, both within North America, and overseas.

CHEMICALS MANAGEMENT

- Competing sources of information from the media and online are sometimes confusing and contradictory which is why environmental health outreach activities, such as Hazardcheck are important. An ongoing challenge is to remain highly visible as an authoritative source and be able to reach all citizens including those in remote and vulnerable populations.
- The CMP has been successful in identifying risks and putting controls in place to manage harmful substances. Measuring the effectiveness of the program in meeting environmental and human health objectives, however, continues to be an area of challenge, given that it takes time to see a measurable response in the environment and in Canadians from the risk management actions taken.
- Domestic action alone is insufficient to protect Canadians and the environment from harmful chemicals. Canadians and their environment are also exposed to chemicals entering Canada through long-range environmental transport and from products imported to Canada.

CONTAMINATED SITES

- While there is a plan in place to remediate the more than 2000 remaining priority sites, there is no simple 'walk-away' solution for the remediation of large contaminated sites such as the Faro (Yukon) and Giant mines (Northwest Territories). This type of site will require long-term monitoring as these sites will be utilizing containment techniques (*e.g.,* on containment of arsenic trioxide at Giant Mine).

PARTNERS TAKING ACTION:
TEACHING CHILDREN ABOUT SAFE AND HEALTHY ENVIRONMENTS

Meet Eddie the Cat, an environmental superhero developed by the Clean Foundation, in partnership with Health Canada and Nova Scotia Environment, to educate children about how the environment affects their health. Through teaching resources available in both official languages, including an online game, Eddie encourages children to learn about air quality, renewable energy, and reducing litter to help keep them and their communities healthy and clean. For more information visit: clean.ns.ca/programs/youth-engagement/sustainability-education/

CANADA IN THE WORLD

Taking action to ensure all Canadians live in safe and healthy communities supports SDG 3 Good Health and Well-Being, SDG 6 Clean Water and Sanitation, SDG 11 Sustainable Cities and Communities and SDG 12 Responsible Consumption and Production.

Target 3.9 – By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.

Target 6.3 – By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, having the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally.

Target 11.6 – By 2030, reduce the adverse per capita environmental impact of cities, including by paying special attention to air quality and municipal and other waste management.

Target 12.4 – By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment.

ANNEXES

ANNEX A: ABOUT THE 2016 TO 2019 FEDERAL SUSTAINABLE DEVELOPMENT STRATEGY

The Strategy contains 13 aspirational goals:

- **Effective action on climate change**: a low-carbon economy contributes to limiting global average temperature rise to well below 2 degrees Celsius and supports efforts to limit the increase to 1.5 degrees Celsius
- **Low-carbon government**: the Government of Canada leads by example by making its operations low-carbon
- **Clean growth**: a growing clean technology industry in Canada contributes to clean growth and the transition to a low-carbon economy
- **Modern and resilient infrastructure**: modern, sustainable, and resilient infrastructure supports clean economic growth and social inclusion
- **Clean energy**: all Canadians have access to affordable, reliable and sustainable energy
- **Healthy coasts and oceans**: coasts and oceans support healthy, resilient and productive ecosystems
- **Pristine lakes and rivers**: clean and healthy lakes and rivers support economic prosperity and the well-being of Canadians
- **Sustainably managed lands and forests**: lands and forests support biodiversity and provide a variety of ecosystem services for generations to come
- **Healthy wildlife populations**: all species have healthy and viable populations
- **Clean drinking water**: all Canadians have access to safe drinking water and, in particular, the significant challenges Indigenous communities face are addressed
- **Sustainable food**: innovation and ingenuity contribute to a world-leading agricultural sector and food economy for the benefit of all Canadians
- **Connecting Canadians with nature**: Canadians are informed about the value of nature, experiencing nature first hand, and actively engaged in its stewardship
- **Safe and healthy communities**: all Canadians live in clean, sustainable communities that contribute to their health and well-being

One or more medium-term targets were set for each goal, and these are supported by indicators to measure progress going forward. Short-term milestones are also presented as steps towards the targets.

The sustainable development strategies tabled by individual departments and agencies, present more detail on the actions taken and the progress being made towards achieving the FSDS goals.

ANNEX B: FSDS INDICATORS

In the Federal Sustainable Development Strategy 2016 to 2019, indicators were added to those provided in earlier strategies to support a more comprehensive strategy and provide important environmental and social context for federal sustainable development commitments and initiatives.

These indicators are presented on the following pages with the most recent data available at the time this report was produced (August 2018). Additional details about the indicators, such as the data sources and methods, can be referenced through the links provided in this annex

ANNEX B.1 EFFECTIVE ACTION ON CLIMATE CHANGE

Long-term goal: A low-carbon economy contributes to limiting global average temperature rise to well below two degrees Celsius and supports efforts to limit the increase to 1.5 degrees Celsius

FSDS 2016 to 2019 starting point	Latest indicator results	Are we heading in the right direction?
In 2014, Canada's greenhouse gas (GHG) emissions level was 732 megatonnes carbon dioxide equivalent (Mt/CO_2 eq).	In 2016 Canada's GHG emissions level was 704 megatonnes carbon dioxide equivalent (Mt/CO_2 eq).	Yes
In 2014, Canada's GHG intensity was 0.42 Mt/CO_2 eq. per $ billion GDP, or 31.5% lower than 1990 (0.62 Mt/CO_2 eq).	In 2016 Canada's GHG intensity was 0.39 Mt/CO_2 eq per $ billion GDP, or 35% lower than 1990.	Yes
Without additional action Canada's emission level is projected to be 815 Mt/CO_2 eq, or more than 55% above our target.	With measures in place and announced as of September 2017, emissions are projected to be 583 Mt/CO_2 eq, or 21% below 2005 levels.	Yes

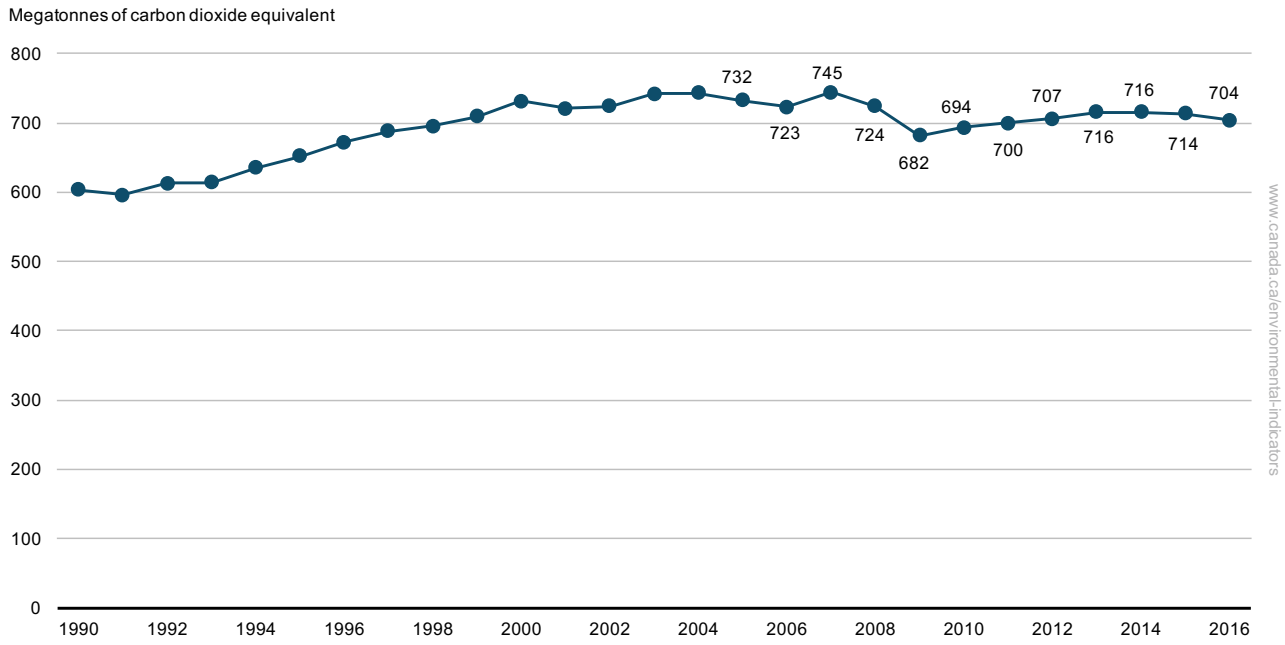
NATIONAL GHG EMISSIONS LEVELS

Between 1990 and 2016, emissions increased by 17%, or 101 megatonnes (Mt) of carbon dioxide equivalent (CO_2 eq) Canada's emissions growth over this period was driven primarily by increased emissions from mining and upstream oil and gas production as well as transportation.

Since 2005, emissions decreased by 28 Mt CO_2 eq or 3.8%. The decrease was driven primarily by reduced emissions from public electricity and heat production utilities.

Canada's total GHG emissions in 2016 were 704 Mt CO_2 eq. Emissions have been decreasing since 2014.

FIGURE B.1 GREENHOUSE GAS EMISSIONS, CANADA, 1990 TO 2016



Note: The national indicator tracks 7 greenhouse gases released by human activity: carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, perfluorocarbons, hydrofluorocarbons and nitrogen trifluoride. Emission levels for some years have been revised in light of improvements to estimation methods and availability of new data. Emissions and removals from the land use, land use change and forestry sector (LULUCF) are excluded from national totals.

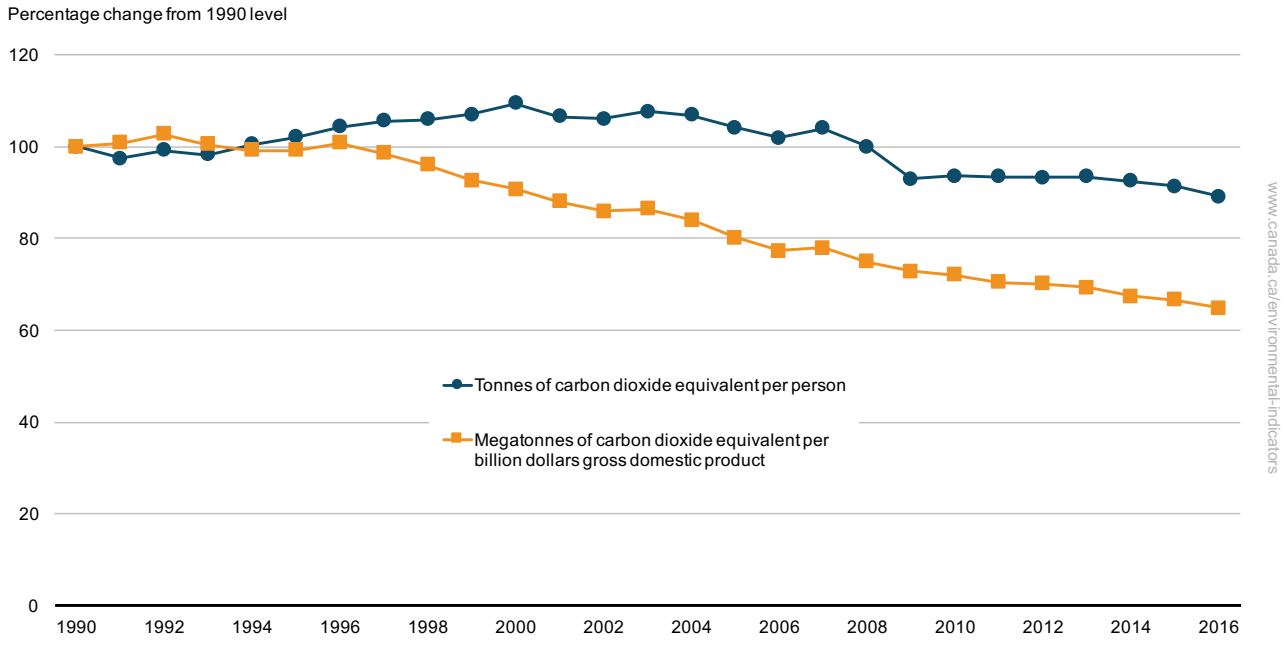
Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Greenhouse gas emissions. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/greenhouse-gas-emissions.html.

GHG INTENSITY

These indicators show the relationship between the size of Canada's population and the amount of GHGs emitted, and how efficiently sectors in the economy are minimizing GHG emissions while producing goods and services for Canada's consumption and export.

The level of emissions per unit of gross domestic product (GDP) was 35% lower in 2016 than in 1990. Over that period, GHGs per unit of GDP decreased from 0.61 Mt CO_2 eq per $ billion GDP in 1990 to 0.39 Mt CO_2 eq per $ billion GDP in 2016. The amount of GHGs emitted per person in Canada decreased to 19.4 tonnes CO_2 eq in 2016, compared with 21.8 tonnes CO_2 eq in 1990. These improvements are attributable to a number of factors such as more efficient industrial processes, a shift to a more service-based economy and a decrease in the emissions associated with energy generation (such as those realized through switching fuels).

FIGURE B.2 INDEXED TREND IN GREENHOUSE GAS EMISSIONS PER PERSON AND PER UNIT OF GDP, CANADA, 1990 TO 2016



Note: The chart presents the ratio of annual GHG per person and per unit of GDP relative to those values in 1990 (that is the values are indexed to 1990). Greenhouse gas per unit of gross domestic product is calculated using real inflation-adjusted GDP in 2007 dollars. Emissions levels for some years have been revised in light of improvements to estimation methods and availability of new data.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Greenhouse gas emissions. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/greenhouse-gas-emissions.html.

PROGRESS TOWARDS CANADA'S GHG EMISSIONS REDUCTION TARGET

In 2015, Canada and 194 other countries reached the Paris Agreement. This agreement aims to limit the global average temperature rise to well below 2 degrees Celsius and pursue efforts to limit the increase to 1.5 degrees Celsius. Under the Agreement, Canada has committed to a target to reduce GHG emissions by 30% below 2005 levels by 2030. This indicator allows the public and policy-makers to see Canada's progress towards meeting its GHG emissions target.

In early 2016, GHG emissions in 2030 were projected to be 815 megatonnes of carbon dioxide equivalent (Mt CO_2 eq). In December 2017, projections were updated to include actions taken by governments, consumers and businesses put in place up to September 2017. Under this scenario, it is projected that Canada's emissions in 2030 would be 722 Mt CO_2 eq, or 93 Mt CO_2 eq below the projections published in February 2016.

Taking into consideration climate change policies and measures that have been announced in Canada and for which enough information is available, a "with specific measures" scenario has also been developed. Under this scenario, emissions in 2030 would be 583 Mt CO_2 eq, or 232 Mt CO_2 eq below the projections published in February 2016. This projected decline, equivalent to approximately a third of Canada's emissions in 2015, is widespread across all economic sectors, reflecting the breadth of the measures announced in the Pan-Canadian Framework on Clean Growth and Climate Change.

Source: Environment and Climate Change Canada (2017) National Inventory Report 1990-2015: Greenhouse Gas Sources and Sinks in Canada. Environment and Climate Change Canada (2017) Canada's Seventh National Communication on Climate Change (PDF; 2.99 MB). Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/progress-towards-canada-greenhouse-gas-emissions-reduction-target.html.

ADDITIONAL INFORMATION ON EFFECTIVE ACTION ON CLIMATE CHANGE

Canadian Environmental Sustainability Indicators

- Carbon dioxide emissions from a consumption perspective
- Temperature change in Canada
- Precipitation change in Canada
- Sea ice in Canada
- Snow cover
- Greenhouse gas emissions: drivers and impacts

Pan-Canadian Framework on Clean Growth and Climate Change

- Pan-Canadian Framework on Clean Growth and Climate Change
- Federal actions for a clean growth economy

Canada's greenhouse gas inventory

- National Inventory Report 1990-2016: Greenhouse Gas Sources and Sinks in Canada

ANNEX B.2 LOW-CARBON GOVERNMENT

Long-term goal: The Government of Canada leads by example by making its operations low-carbon

FSDS 2016 to 2019 starting point	Latest indicator results	Are we heading in the right direction?
As of 2014-15, responsible departments and agencies have reduced GHG emissions from their buildings and fleet by 19% relative to fiscal year 2005-06.	In 2016-17, federal GHG emissions were 28% lower than in 2005-06.	Yes

PERCENTAGE CHANGE IN ENERGY RELATED GHG EMISSIONS FROM FACILITIES AND FLEETS FROM 2005–06

The federal government tracks its energy use and GHG emissions across departments and agencies that own real property and other GHG emitting assets. The federal GHG emissions are from the energy used for office space, laboratories and warehouses (88%), and its "fleets" (12%), that is, federal cars, vans, trucks, boats, ships and planes.

In the 2016-17, GHG emissions from federal operations were 28% lower than in 2005-06, the target base year for this indicator.

FIGURE B.3 REPORTED FEDERAL GREENHOUSE GAS EMISSIONS IN FISCAL YEAR 2016-17 AND REDUCTIONS SINCE 2005

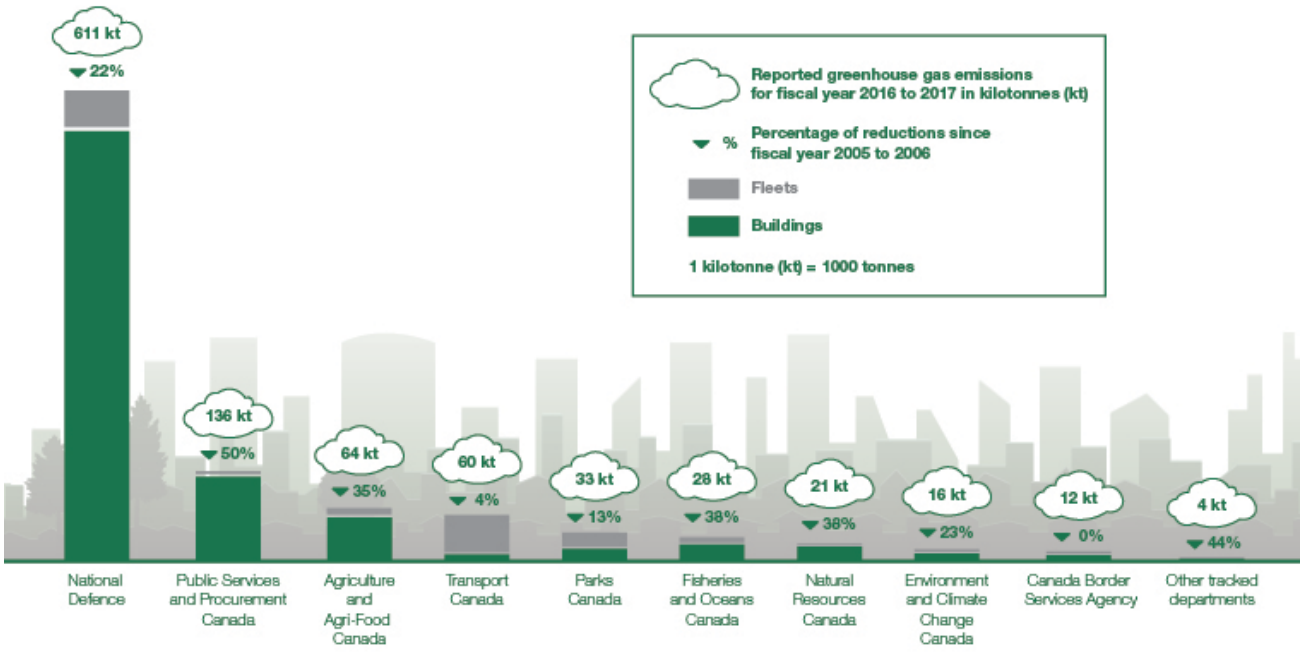
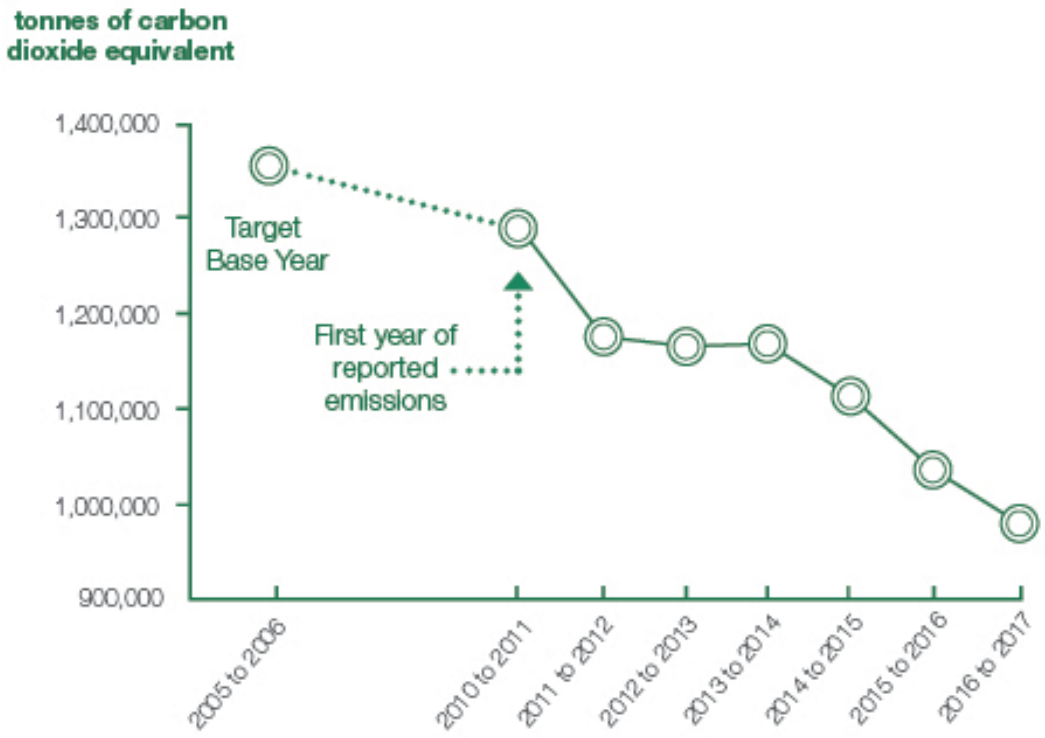


FIGURE B.4 GREENHOUSE GAS EMISSIONS REPORTED



Source: Treasury Board Secretariat. (2017) Greening Government Infographic (PDF; 5.6 MB) Available at: www.canada.ca/content/dam/tbs-sct/documents/innovation/gg-infographic-eng.pdf.

ADDITIONAL INFORMATION ON LOW-CARBON GOVERNMENT

Greening government

- Greening Government Strategy

ANNEX B.3 CLEAN GROWTH

Long-term goal: A growing clean technology industry in Canada contributes to clean growth and the transition to a low carbon economy

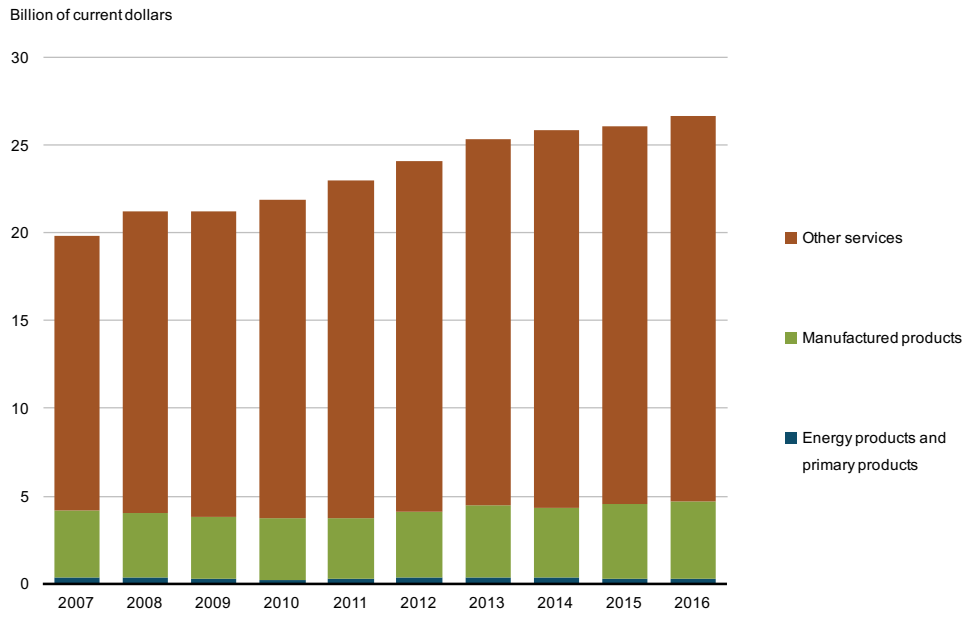
FSDS 2016 to 2019 starting point	Latest indicator results	Are we heading in the right direction?
Funding is provided to Statistics Canada to define the industries in the sector, establish the 2015 baseline on the industry by 2018, and track the contribution of clean technology to GDP, as well as the number of jobs related to clean technology.	In 2016, clean technology activities accounted for 1.4% of Canada's GDP and an estimated 178,000 jobs.	Completed

CLEAN TECHNOLOGY SECTOR GDP

The environmental and clean technology products economic account measures the contribution of environmental goods and services in the Canadian economy, including products such as clean energy, waste management, environmental and clean technology product manufacturing and other technical services.

Environmental and clean technology activities accounted for 1.4% or $26.7 billion of GDP in 2016 (in current dollars). This ratio has remained stable over the 10-year period.

FIGURE B.5 COMPOSITION OF ENVIRONMENTAL AND CLEAN TECHNOLOGY GROSS DOMESTIC PRODUCT



Note: Clean sector GDP excludes electricity generation and waste management GDP.

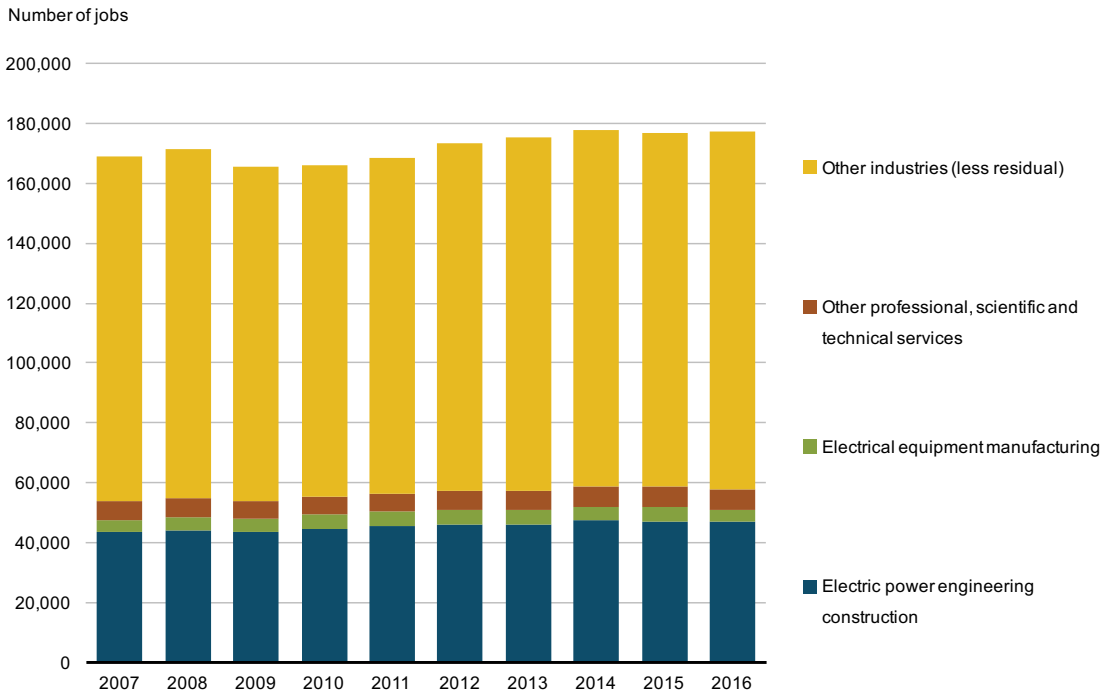
Source: Statistics Canada (2018) Table 36-10-0366-01 Environmental and Clean Technology Products Economic Account, production account (x 1,000,000) (www150.statcan.gc.ca/t1/tbl1/en/cv.action?pid=3610036601&request_locale=en).

CLEAN TECHNOLOGY SECTOR JOBS

The number of jobs related to clean technology increased by 5.0% between 2007 and 2016 to reach an estimated 178,000 jobs in 2016.

About 25% of the clean technology jobs were related to electric power engineering construction. Excluding this category, environmental and clean technology employment comprised about 130,000 jobs in 2016, up 3.9% from 2007.

FIGURE B.6 ENVIRONMENTAL AND CLEAN TECHNOLOGY PRODUCTS ECONOMIC ACCOUNT, EMPLOYMENT



Note: The data provides estimates on jobs in environmental and clean technology goods and services production. Examples of those goods and services are listed in the Reference Guide 16-511-x. Other industries excludes clean waste management jobs outside the waste management industry (e.g., municipal garbage services).

Source: Statistics Canada, Table 36-10-0411-01 Environmental and Clean Technology Products Economic Account, employment (www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3610041101&request_locale=en).

ADDITIONAL INFORMATION ON CLEAN GROWTH

Mission Innovation

- http://mission-innovation.net/

ANNEX B.4 MODERN AND RESILIENT INFRASTRUCTURE

Long-term goal: Modern, sustainable, and resilient infrastructure supports clean economic growth and social inclusion

FSDS 2016 to 2019 starting point	Latest indicator results	Are we heading in the right direction?
Average percentage decrease in volume of water leakage and/or infiltration attributed to funded investments.	A limited number of Provinces and Territories indicated that they would be using this specific indicator to measure project results and for those reporting on the indicator, the methodology and calculations proposed are not consistent between projects from various Provinces and Territories. Therefore, Infrastructure Canada will no longer use this indicator and will identify another indicator for the new 2019 to 2022 FSDS.	
Number of systems that have improved the quality of wastewater effluent or storm water discharge as a result of funded investments.	1056 Clean Water and Wastewater Fund projects (in 642 systems) are under construction as of August 15, 2018. This excludes 261 already completed projects (in 206 systems).	Yes
Improvement to infrastructure-related data.	Infrastructure Canada has worked with Statistics Canada to develop and launch Canada's Core Public Infrastructure survey. The survey results will reveal the current state and condition of public infrastructure assets across the country, and create a national baseline of information for better evidence-based decision-making.	Yes

DECREASE IN VOLUME OF WATER LEAKAGE AND/OR INFILTRATION ATTRIBUTED TO FUNDED INVESTMENTS

Water, wastewater and storm water infrastructure is essential to keeping our waterways clean and our communities healthy and livable. Through the Clean Water and Wastewater Fund (CWWF), launched in 2016-17 and scheduled to be completed in 2019-20, Infrastructure Canada provides communities with more reliable water and wastewater systems so that both drinking water and effluent meet legislated standards. The program targets projects that will contribute to the rehabilitation of both water treatment and distribution infrastructure and existing wastewater and storm water treatment systems; collection and conveyance infrastructure; and initiatives that improve asset management, system optimization, and planning for future upgrades to water and wastewater systems.

TABLE B.1 CLEAN WATER WASTEWATER FUND (CWWF) ALLOCATIONS

Province/Territory	Base funding Allocation	Net Population percentage (%)	Per Capita Allocation	Total Funding
Newfoundland and Labrador	$50,000,000	1.54%	$20,600,134	$70,600,134
Prince Edward Island	$50,000,000	0.42%	$5,654,677	$55,654,677
Nova Scotia	$50,000,000	2.76%	$36,869,027	$86,869,027
New Brunswick	$50,000,000	2.20%	$29,449,770	$79,449,770
Quebec	$50,000,000	23.47%	$313,774,400	$363,774,400
Ontario	$50,000,000	38.87%	$519,642,062	$569,642,062
Manitoba	$50,000,000	3.39%	$45,250,782	$95,250,782
Saskatchewan	$50,000,000	2.94%	$39,342,112	$89,342,112
Alberta	$50,000,000	10.98%	$146,714,129	$196,714,129
British Columbia	$50,000,000	13.10%	$175,067,721	$225,067,721
Yukon	$50,000,000	0.10%	$1,390,275	$51,390,275
Northwest Territories	$50,000,000	0.13%	$1,711,108	$51,711,108
Nunavut	$50,000,000	0.10%	$1,336,803	$51,336,803
Total	**$650,000,000**	**100.00%**	**$1,336,803,000**	**$1,986,803,000**

Source: Infrastructure Canada (2017). Available at: www.infrastructure.gc.ca/plan/cwwf-fepteu-table-tableau-eng.html.

ANNEX B.5 CLEAN ENERGY

Long-term goal: All Canadians have access to affordable, reliable and sustainable energy

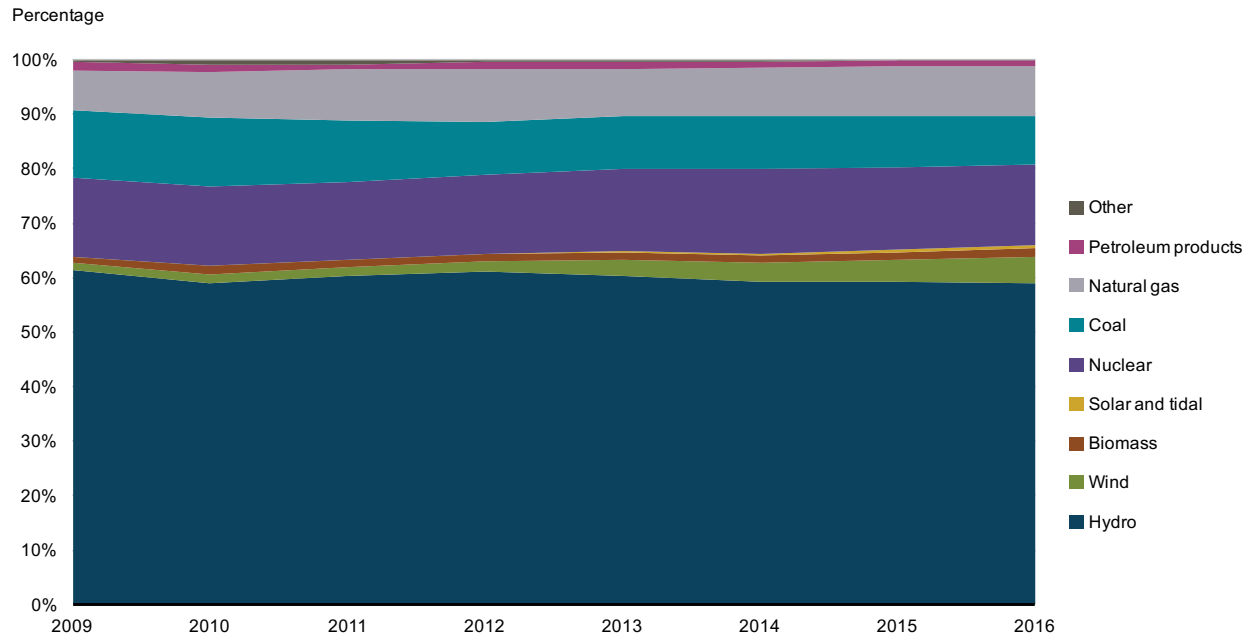
FSDS 2016 to 2019 starting point	Latest indicator results	Are we heading in the right direction?
In 2014, 64.4% of Canada's electricity came from renewable sources.	In 2016, 66% of Canada's electricity came from renewable sources.	Yes
In 2013, clean electricity represented 37% of total North America power generation.	In 2016, almost 40% of electricity generation came from clean electricity in North America.	Yes

ELECTRICITY GENERATION BY SOURCE

The percentage of Canada's electricity generated from renewable sources has increased in recent years due in part to provinces' efforts to phase out the use of coal and other fossil fuels for electricity generation. For example, British Columbia and Manitoba retired thermal generation facilities in 2016. Wind was the dominant source of new renewable capacity in Canada in 2016.

Canada's generation of electricity from renewable sources grew by approximately 13% between 2009 and 2016 bringing Canada's percentage of electricity generation from renewable energy sources to 66% of all electricity generated. Of the renewables, wind capacity has significantly increased with an annual average growth rate of 24% since 2009, and accounted for 4.7% of total electricity generation in 2016.

FIGURE B.7 ELECTRICITY GENERATION BY SOURCE, CANADA, 2009 TO 2016



Note: Other includes electricity from thermal generation that cannot be classified as generation from petroleum, natural gas, coal, nuclear or biomass.

Source: Data from Statistics Canada, Natural Resources Canada and the Canadian Wind Energy Association, compiled by Natural Resources Canada.

ANNEX B.6 HEALTHY COASTS AND OCEANS

Long-term goal: Coasts and oceans support healthy, resilient and productive ecosystems

FSDS 2016 to 2019 starting point	Latest indicator results	Are we heading in the right direction?
In 2010, 73% of Canada's shellfish growing area was classified as approved or conditionally approved for shellfish harvesting for human consumption.	In 2017, 68% of Canada's shellfish harvest area was classified as approved or conditionally approved for shellfish harvesting for human consumption.	No
The presence of eelgrass, a marine plant species that is sensitive to environmental change, will be tracked.	Eelgrass is present off the coasts of British Columbia, Quebec and maritime provinces.	Indicator in development
From 1990 to 2014, protected coastal and marine area increased from 0.34% of Canada's marine territory to 0.9%.	From 1990 to December 2017, conserved coastal and marine area increased from 0.34% of Canada's marine territory to approximately 7.7%.	Yes
In 2015, 96% of 159 major fish stocks were managed and harvested at levels considered to be sustainable, up from 90% in 2011.	In 2016, 96% of 170 major fish stocks were managed and harvested at levels considered to be sustainable, up from 90% in 2011.	Yes
In 2015, 49% of 159 major fish stocks were classified as in the healthy zone, 19% were classified in the cautious zone, 12% were classified as in the critical zone, and 19% were not classified in any of the three precautionary approach zones due to information gaps.	In 2016, 45% of 170 major fish stocks were classified as in the healthy zone, 18% were classified in the cautious zone, 12% were classified as in the critical zone, and 25% were not classified in any of the three precautionary approach zones due to information gaps.	No
In 2013-14, detected 44 spills from identified vessels, compared with 21 in 2009-10 (however, patrol hours also increased 70% in the same period).	In 2016-17, we detected 26 spills from identified vessels, compared with 21 in 2009-10 (patrol hours decreased 9% in the same period).	Yes
In 2014, 100% of monitored ocean disposal sites required no management action, indicating that they were being used sustainably.	In 2016, 100% of monitored ocean disposal sites required no management action, indicating that they were being used sustainably.	Yes

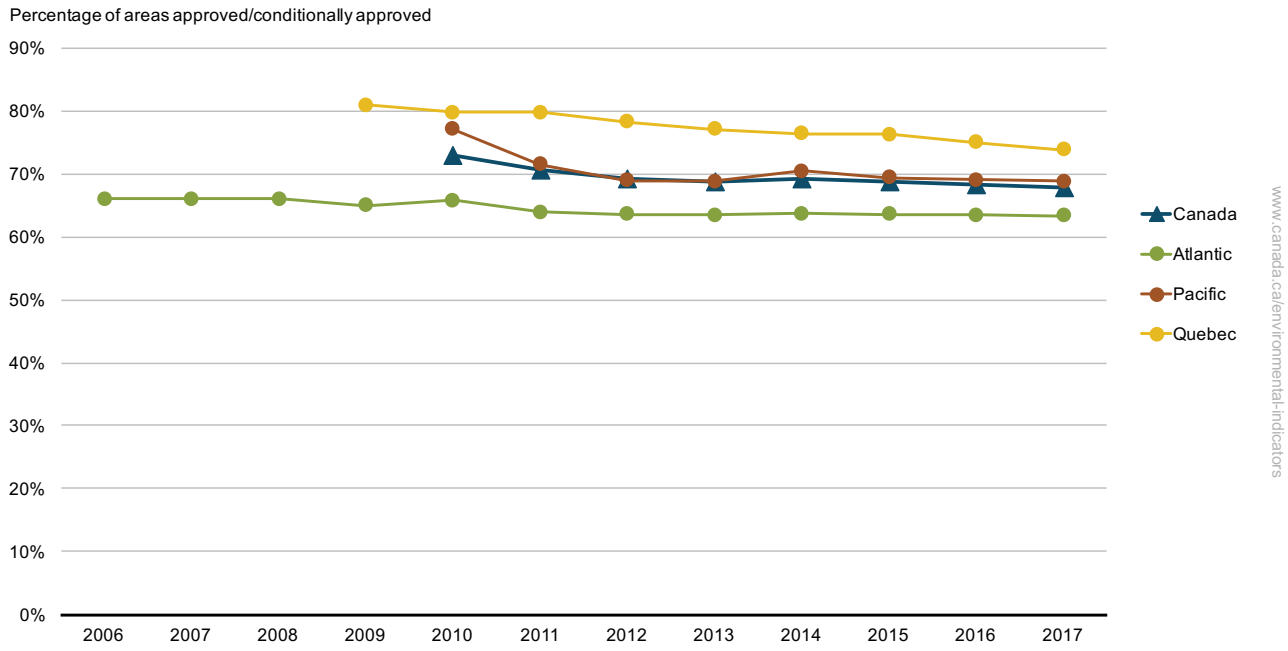
SHELLFISH HARVEST AREA QUALITY

Shellfish accumulate contaminants from their surroundings, such as bacteria from human or animal waste, or other pollutants found in coastal waters. When the level of contaminants is high enough to make shellfish unsafe to eat, harvest areas are closed for food safety. The proportion of harvest area open is a partial measure of the quality of marine coastal water.

In 2017, 68% of Canada's shellfish harvest area was classified as approved or conditionally approved for shellfish harvesting for human consumption. On the Quebec coast, 74% of the shellfish harvest area was approved or conditionally approved, compared to 69% on the Pacific coast and 63% on the Atlantic coast.

There is a slow decline in approved or conditionally approved area in Quebec but it could be due to more precautionary restrictions.

FIGURE B.8 APPROVED/CONDITIONALLY APPROVED SHELLFISH HARVEST AREAS, 2006 TO 2017



Note: Shellfish harvest area classifications are based on fecal coliform contamination and presented as the total shellfish harvest area assigned to each class.

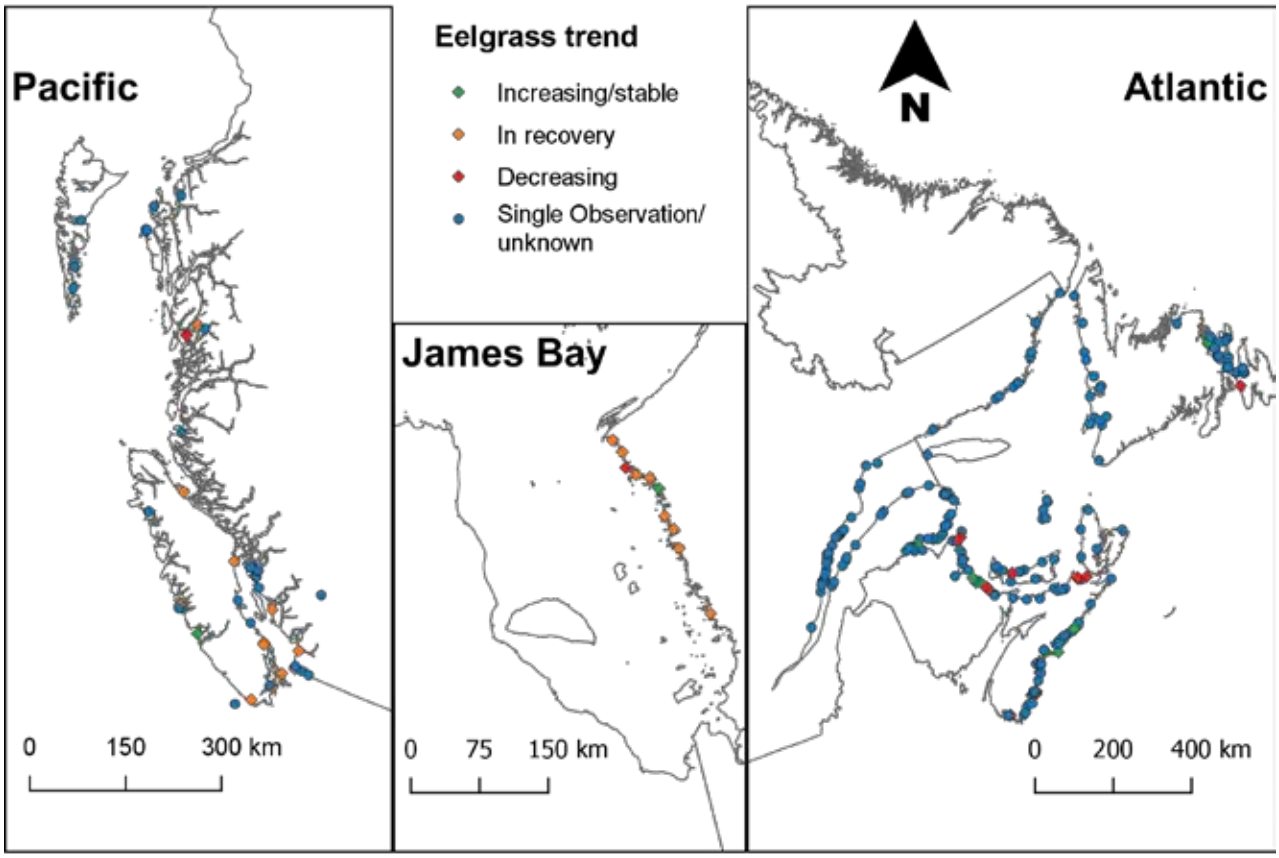
Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Shellfish harvest area quality. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/shellfish-harvest-area-quality.html.

PRESENCE OF EELGRASS

Eelgrass plays important roles in coastal and estuarine ecosystems. Eelgrass beds form a habitat for many species, as well as providing coastal protection and an important carbon sink.

While it is abundant in many areas, it is sensitive to disturbance. Tracking changes in eelgrass will provide an important indicator of coastal ecosystem health. For this reason, we have been collating information on eelgrass sites from many sources to establish a baseline for an indicator.

FIGURE B.9 EELGRASS INVENTORY SITES, CANADA, 2018



Note: Data collection is continuing and not all known eelgrass sites are reported here. Varying types and ages of data are combined. Site in recovery include areas of active restoration efforts.

Source: Environment and Climate change Canada (2018) Canadian Environmental Sustainability Indicators.

CANADA'S CONSERVED AREAS (MARINE)

Protected areas and other conserved areas are lands and waters where use is limited for the purpose of conserving nature. Protection does not always isolate areas from use, including industrial activity and the harvest of biological resources. Nature conservation, however, must be the primary purpose.

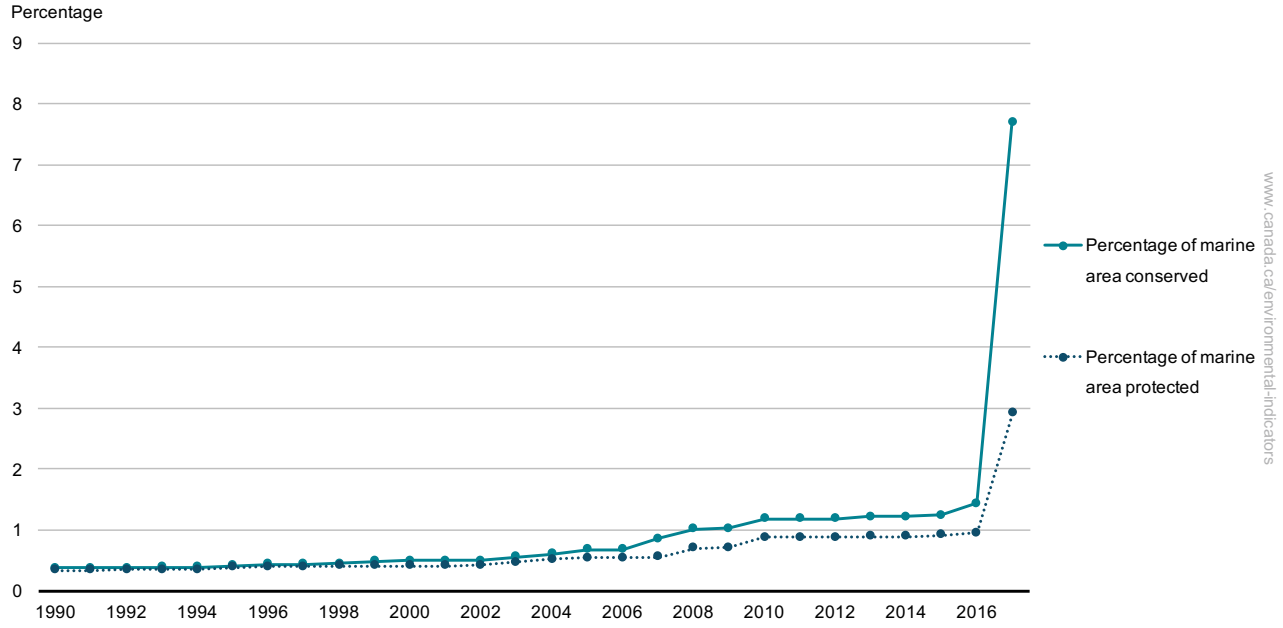
As of the end of 2017, 7.7% of Canada's marine territory was conserved, including 2.9% in protected areas. Marine areas conserved have increased by a factor of more than 18 in the last 20 years, and by more than 5 times in the last 5 years. The significant increase can be attributed to several new marine protected areas, including Tallurutiup Imanga National Marine Conservation Area, and 51 marine refuges established since 2016.

There is on-going conservation of marine areas and the area conserved continually grows. As of June 2018, approximately 7.9% of Canada's marine territory has been conserved.

In 2017, conservation measures other than protected areas have been tracked and information on marine refuges is now being included. Conservation areas include both protected areas and other conservation measures.

Areas that are managed to conserve biodiversity may not be recognized under the internationally accepted definition of a protected area, but still contribute to national and international targets. At the end of 2017, all the other conservation measures that have been identified as contributing to these targets were long-term fisheries area closures, which have been classified as marine refuges.

FIGURE B.10 PROPORTION OF MARINE AREAS CONSERVED, CANADA, 1990 TO 2017



Note: Protected areas include only areas recognized under international standards. Conserved areas include protection as well as other effective area-based conservation measures, such as marine refuges.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Canada's conserved areas. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/conserved-areas.html.

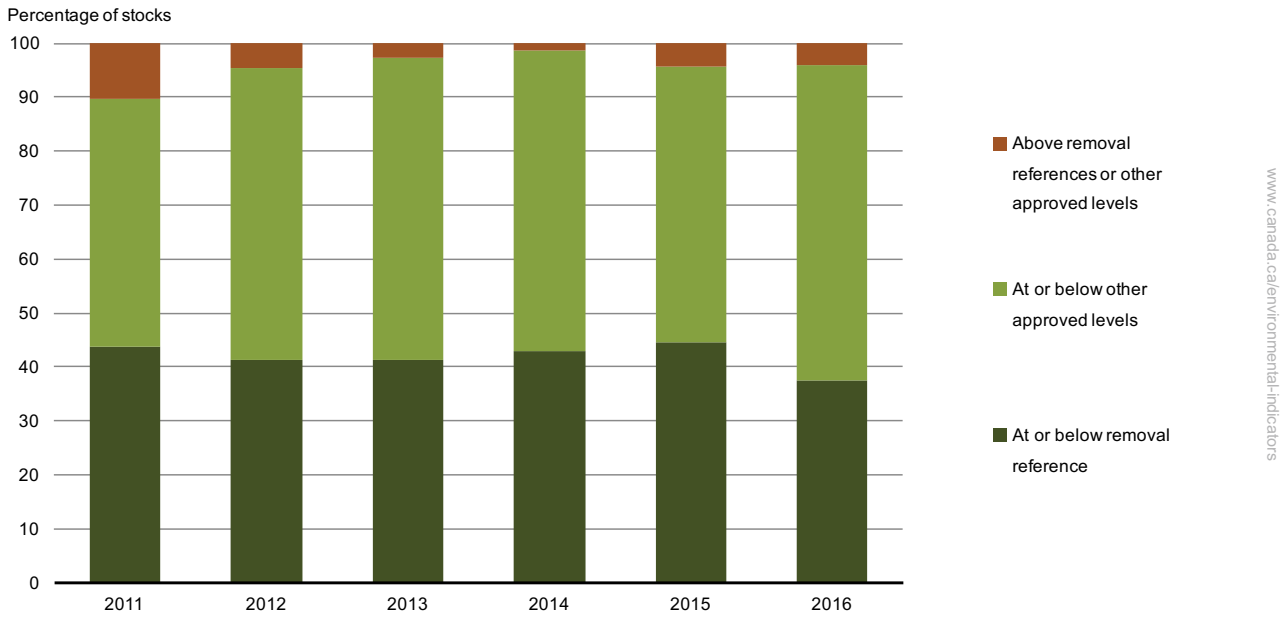
SUSTAINABLE FISH HARVEST

The preservation of the ecological, social and economic value of fish stocks requires limits on harvest. Overfishing and other pressures can reduce the size and productivity of fish stocks and in the past have led to their collapse. Harvest limits for wild fish and other marine animals are set to protect these stocks for the future.

Of the 170 major stocks assessed in 2016, 163 (96%) were harvested at levels considered to be sustainable. Seven stocks (4%) were harvested above approved levels. From 2012 to 2016, the percentage of overharvested stocks has been consistently low.

Overharvest means a stock has been harvested above its removal reference or other approved level. Overharvesting can occur when fish are accidentally caught as bycatch (that is, caught unintentionally while fishing for another stock or size class) or if fishers exceed their quota. For 2 of the 7 stocks overharvested in 2016, quota reconciliation was applied. This means that the amount overharvested in 2016 was deducted from the harvest limit in 2017. For the others, specific management actions were taken, such as restricting the allowable catch, season length, fishing areas and permitted gear.

FIGURE B.11 HARVEST OF MAJOR STOCKS RELATIVE TO APPROVED LEVELS, CANADA, 2011 TO 2016



Note: The removal reference is a harvest rate that is estimated to be biologically sustainable, based on an analytical assessment of historical stock productivity data. When removal references are not available, other approved levels are established. Comparisons between years should be made with caution as the list of major stocks has changed.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Sustainable fish harvest. Consulted on 31 August, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/sustainable-fish-harvest.html.

STATUS OF MAJOR FISH STOCKS

Environmental conditions and human use of the oceans affect the abundance and health of fish stocks, at national and global levels. In order to protect fish stocks for future generations, it is important to track their condition and adjust management accordingly.

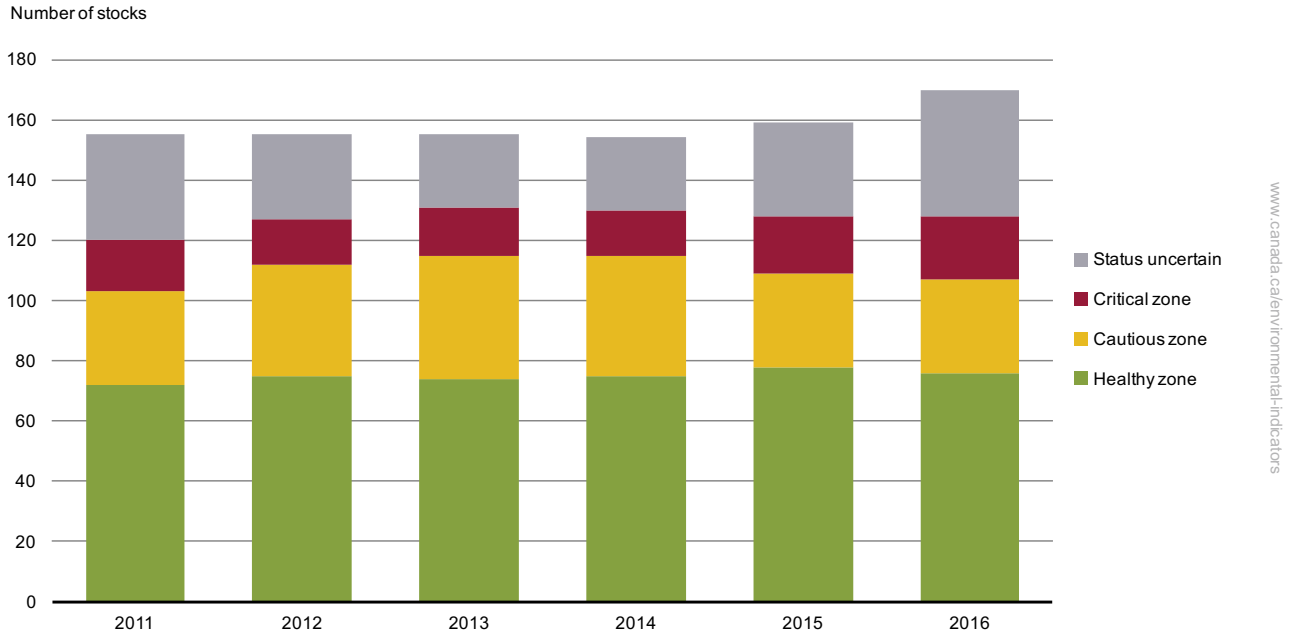
Of the 170 major stocks assessed in 2016:

- 76 stocks (45%) were classified as Healthy;
- 31 stocks (18%) were classified as Cautious;
- 21 stocks (12%) were classified as Critical; and
- 42 stocks (25%) could not be classified with current information.

Changes in stock status happen slowly. It may take many years for biological systems to respond to changes in management. Environmental changes such as shifts in climate and ocean currents may also cause some stocks to reproduce more slowly. As such, even if a stock is harvested at levels considered sustainable, it may still be classified as critical or cautious. There has been little change in the overall status of stocks since 2011, as expected for such a short time frame.

Since 2011, changes were made to the survey to improve its usefulness as a management tool and the list of major stocks was revised. In 2016, 170 major stocks were included, up from 155 in 2011.

FIGURE B.12 STATUS OF MAJOR FISH STOCKS, CANADA, 2011 TO 2016



Note: Fish stocks are classified by comparing the size of stocks to reference points. Stocks include a variety of harvested marine animal species, not only finfish. Comparisons between years should be made with caution as the list of major stocks has changed.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Status of major fish stocks. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/status-major-fish-stocks.html.

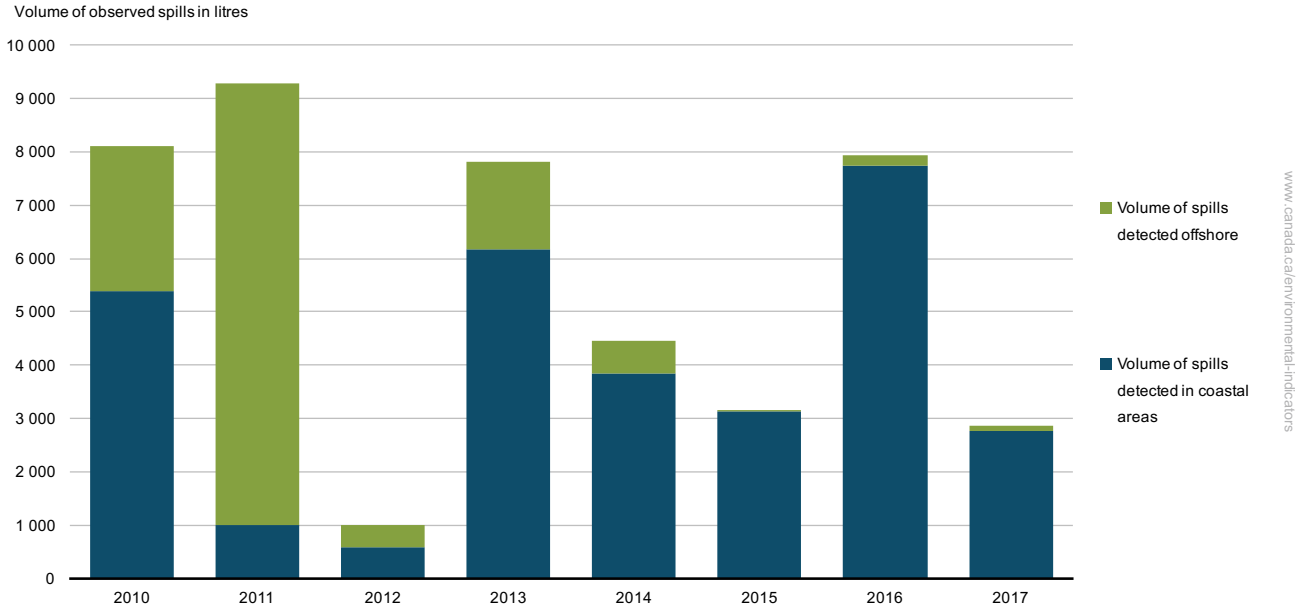
NUMBER AND VOLUME OF POLLUTANT SPILLS FROM SHIPS

The federal government actively monitors ships in Canadian waters to help prevent pollution in our oceans and coasts as significant marine pollution spills can have long-term negative environmental and economic consequences.

In 2017, the National Aerial Surveillance Program detected 2878 litres of marine pollution spills in Canadian waters.

Spills are mainly detected within Canada's coastal areas, including the Great Lakes. Coastal areas have higher traffic and a greater risk of accidents, such as ships running aground. Overall, the volume of spills detected offshore has decreased since 2010 and has accounted for less than 2% of all detected spills since 2015. Between 2016 and 2017, spills from known sources per patrol hour decreased by 24% and the total volume decreased by 65%. The volume of marine pollution spills varies from year to year, and a single major spill can drastically affect the total volume. The large increase observed in 2013, for example, can be attributed to 2 ship-source spills that accounted for 5098 litres. The M/V Marathassa oil spill in 2016 accounted for 3419 litres.

FIGURE B.13 VOLUME OF MARINE POLLUTION SPILLS DETECTED OFFSHORE AND IN COASTAL AREAS FROM AERIAL SURVEILLANCE, CANADA, 2010 TO 2017



Note: Year refers to fiscal year, which runs from April 1 to March 31. The year 2017 therefore refers to April 1, 2016 to March 31, 2017.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Marine pollution spills. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/marine-pollution-spills.html.

MONITORING DISPOSAL AT SEA

Disposal at sea is the deliberate discarding of approved material from a ship, aircraft, platform or other structure at sea. In Canada, it is illegal to dispose of material at sea without a permit. Permits are issued for non-hazardous material when it is determined that disposal at sea is the most environmentally preferable and practical alternative. The materials disposed of at sea are primarily dredged material, fish waste or excavation waste.

Since 2007, there has been no evidence of marine pollution from disposal activities at monitored ocean disposal sites.

TABLE B.2 MONITORED OCEAN DISPOSAL SITES WITH NO EVIDENCE OF MARINE POLLUTION FROM DISPOSAL ACTIVITIES, CANADA, 2007 TO 2016

Year	Number of sites monitored	Number of sites with no evidence of marine pollution from disposal activities	Performance target met
2007	6	6	Yes
2008	20	20	Yes
2009	6	6	Yes
2010	8	8	Yes
2011	7	7	Yes
2012	11	11	Yes
2013	12	12	Yes
2014	19	19	Yes
2015	11	11	Yes
2016	11	11	Yes

Note: Year refers to fiscal year, which runs from April to March. The year 2016 therefore refers to April 1, 2015 to March 31, 2016.

Source: Environment and Climate Change Canada (2017) Canadian Environmental Sustainability Indicators: Monitoring disposal at sea. Consulted on 31 August 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/monitoring-disposal-at-sea.html.

ADDITIONAL INFORMATION ON HEALTHY COASTS AND OCEANS

Canadian Environmental Sustainability Indicators

- Canada's conserved areas
- Sustainable fish harvest
- Status of major fish stocks
- Marine pollution spills
- Shellfish growing area quality indicator
- Monitoring disposal at sea

Department of Fisheries and Oceans. Meeting Canada's marine conservation targets

- 5 Percent Interim Target Achieved

Parks Canada. State of Canada's Natural and Cultural Heritage Places 2016. Part B: The State of Canada's Natural and Cultural Heritage Places Administered by Parks Canada

- The State of Canada's Natural and Cultural Heritage Places 2016

ANNEX B.7 PRISTINE LAKES AND RIVERS

Long-term goal: Clean and healthy lakes and rivers support economic prosperity and the well-being of Canadians

FSDS 2016 to 2019 starting point	Latest indicator results	Are we heading in the right direction?
National freshwater quality remained relatively stable between 2003 to 2005 and 2010 to 2012 and is considered fair to good.	The indicators show that national freshwater quality remained relatively stable between 2002 and 2016 and is considered fair to good at over 75% of the monitoring sites.	Yes
Water quantity was generally normal between 2002 and 2011.	Water quantity remained generally normal between 2001 and 2015. However, since 2010, there has been an increase in sites with a higher-than-normal quantity.	No
As of March 2015, projects funded by Government of Canada were preventing about 4040 kilograms (kg) of phosphorus from entering the Lake Simcoe watershed.	As of March 2017, projects completed were preventing about 6188 kg of phosphorus per year from entering Lake Simcoe.	Completed
As of March 2015, projects funded by Government of Canada were preventing about 124 kg of phosphorus from reaching South-eastern Georgian Bay and its tributaries.	As of March 2017, projects completed an estimated 5706 kg of phosphorus per year from reaching south-eastern Georgian Bay and its tributary rivers.	Yes
As of March 2015, projects funded by Government of Canada were preventing about 14,800 kg of phosphorus from entering Lake Winnipeg and its tributaries.	As of March 2017, projects completed were preventing about 29,715 kg of phosphorus per year from entering Lake Winnipeg and its tributaries.	Yes
While no Area of Concern has been delisted since 2010, the number of beneficial uses considered "impaired" has decreased by 41% since the areas were initially assessed.	While no Area of Concern has been delisted since 2010, 1 is nearing the final stages of delisting. 12 impaired beneficial uses were restored in 2016 and 2017.	Yes
The rate of compliance with Metal Mining Effluent Regulations and Pulp and Paper Effluent Regulations is very high: over 95%.	High compliance rates with *Fisheries Act* regulations on effluent have been maintained by: • pulp and paper industry: in 2016, tests for toxicity met regulatory standards 97.3% of the time and tests for biochemical oxygen demand and total suspended solids met regulatory standards 99.9% of the time. • metal mining industry: in 2016, over 99.3% compliance for deleterious substances and pH levels, except for total suspended solids (98%). Compliance for acute lethal toxicity testing was 95.7%.	Yes

WATER QUALITY IN CANADIAN RIVERS

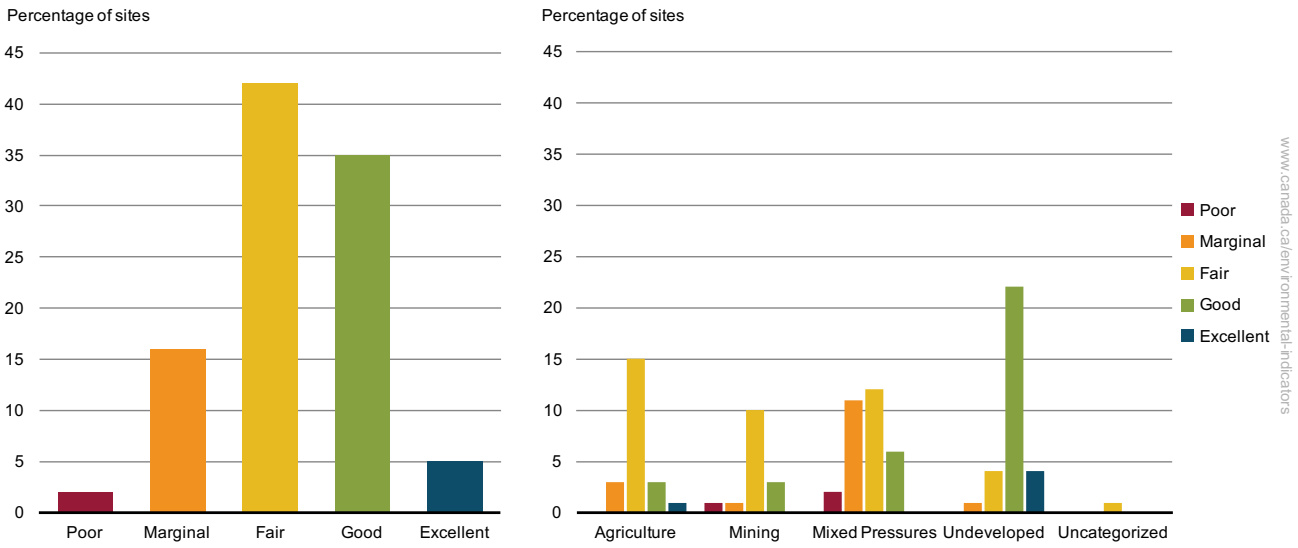
Healthy river ecosystems rely on clean water.

For the 2014 to 2016 period, water quality in rivers in Canada was fair to good at just over 75% of the monitoring sites. This classification means it can maintain healthy river ecosystems.

Water quality is generally very good in undeveloped areas where native plants, trees and soils purify the water before it reaches the river. Adding manufacturing and cities to the landscape means hundreds of different chemicals are released into rivers every day. As well, many contaminants make their way into rivers after being released into the air through burning. Pollution from agriculture reaches rivers through run-off across the soil surface or by seeping into groundwater. All of these developments change water quality in a river and put pressure on the plants and animals that live there.

Water quality in a river tends to change slowly. Natural factors, such as snow and rainfall, affect water quality by washing pollution that builds up on the surface of roads and fields into the river. A dry year can mean better water quality because less pollution is washed into the river. A changing climate that results in longer wet periods may make water quality worse for longer periods of time. Analysis indicates that water quality has not changed between 2002 and 2016 at a majority of sites across southern Canada. Where it has changed, it has improved slightly more often than it has gotten worse.

FIGURE B.14 WATER QUALITY, CANADA, 2014 TO 2016 PERIOD



Note: Water quality was evaluated at 178 sites across southern Canada using the Canadian Council of Ministers of the Environment's water quality index. Two sites have not had their land use categorized because they are close to the Canada-United States border or the ocean.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Water quality in Canadian rivers. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/water-quality-canadian-rivers.html.

WATER QUANTITY IN CANADIAN RIVERS

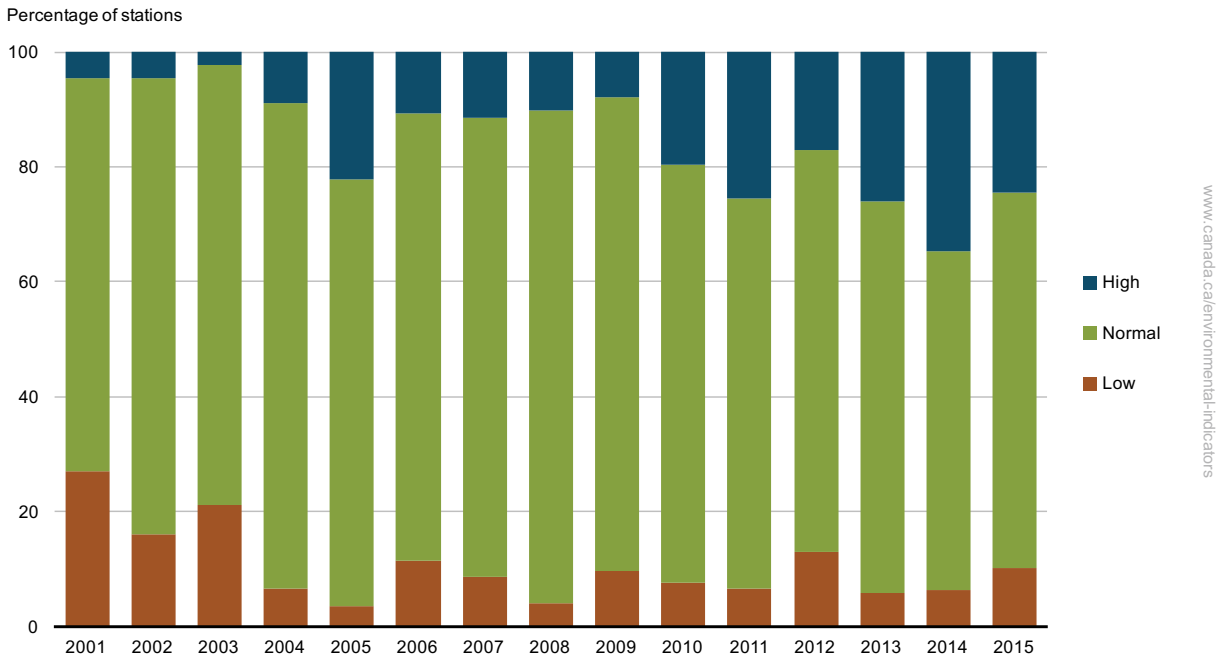
Canada is a water-rich country. However, too much or too little water can lead to serious problems. When there is too little water, there may not be enough water to irrigate farmland and there may be drought. When there is too much, rivers may flood.

In 2015, about 25% of water quantity stations across Canada had a higher-than-normal water quantity, 10% had a lower-than-normal quantity and 65% had a normal quantity.

- From 2001 to 2015, most Canadian rivers had normal water quantity.
- Since 2010, there has been an increase in sites with a higher-than-normal quantity.
- The percentage of stations with a lower-than-normal quantity has declined since 2001.

Water quantity in Canadian rivers is measured as water flow, or the volume of water moving over a point, over a fixed period of time. Water flows in rivers generally follow changes in temperature, rainfall and snowfall throughout the year. More precipitation increases the amount of water in rivers, whereas warmer temperatures and less rainfall or snowfall will result in less water.

FIGURE B.15 WATER QUANTITY AT MONITORING STATIONS, CANADA, 2001 TO 2015



Note: The water quantity classification for a station is based on a comparison of the most frequently observed flow condition in a given year with average water quantity at that station between 1981 and 2010. The 2014 and 2015 data include fewer results from Quebec and British Columbia because of delays in getting data into the database.

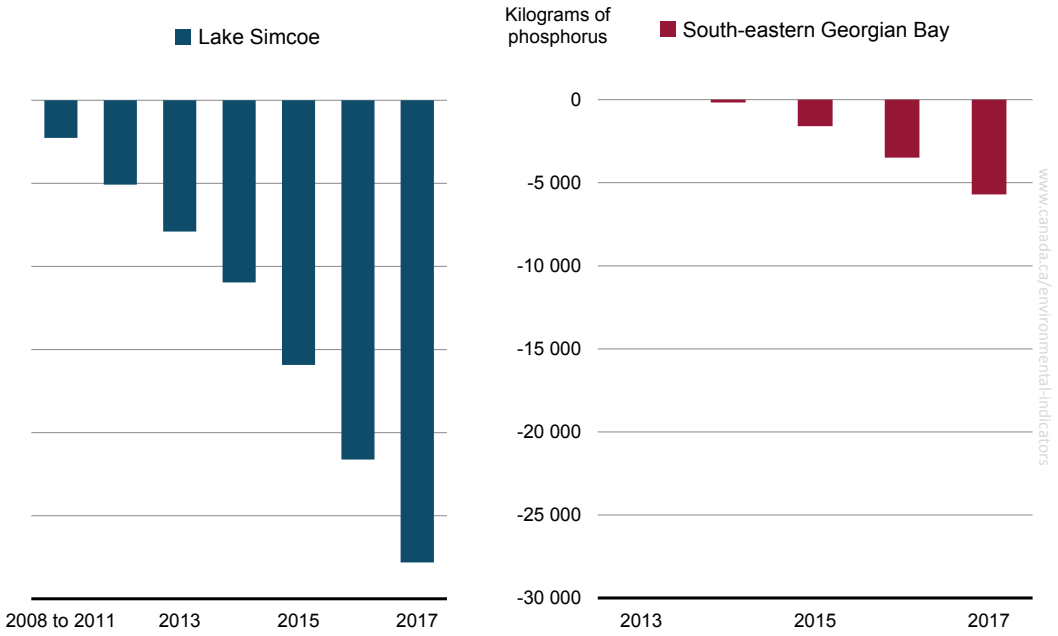
Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Water quantity in Canadian rivers. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/water-quantity-canadian-rivers.html.

REDUCING PHOSPHORUS LOADS TO LAKE SIMCOE AND SOUTH-EASTERN GEORGIAN BAY

Projects funded by the Lake Simcoe Clean-Up Fund (April 2007 to March 2012) and Lake Simcoe / South-eastern Georgian Bay Clean-Up Fund (April 2012 to March 2017) contribute to reducing the amount of phosphorus reaching the water bodies from their watersheds.

Stewardship projects completed between 2008 and 2017 have prevented an estimated 6188 kg of phosphorus per year from entering Lake Simcoe. Since its inception, the Lake Simcoe Clean-Up Fund has prevented a cumulative total of 27,805 kg of phosphorus from reaching Lake Simcoe and its tributary rivers. Similar projects completed between 2013 and 2017 have prevented an estimated 5706 kg of phosphorus from reaching south-eastern Georgian Bay and its tributary rivers.

FIGURE B.16 CUMULATIVE, ESTIMATED REDUCTION IN THE AMOUNT OF PHOSPHORUS REACHING LAKE SIMCOE, 2008 TO 2017, AND SOUTH-EASTERN GEORGIAN BAY, 2013 TO 2017, DUE TO STEWARDSHIP PROJECTS



Note: The reduced phosphorus load estimates are calculated using data from all projects completed between April 1, 2008 and March 31, 2017. Data are presented by fiscal year; for example, data for 2017 represents projects implemented between April 1, 2016 and March 31, 2017. Figures for each project type are rounded and then summed to calculate the total.

Source: Environment and Climate Change Canada (2017) Canadian Environmental Sustainability Indicators: Reducing phosphorus loads to Lake Simcoe and south-eastern Georgian Bay. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/reducing-phosporus-lake-simcoe-georgian-bay.html.

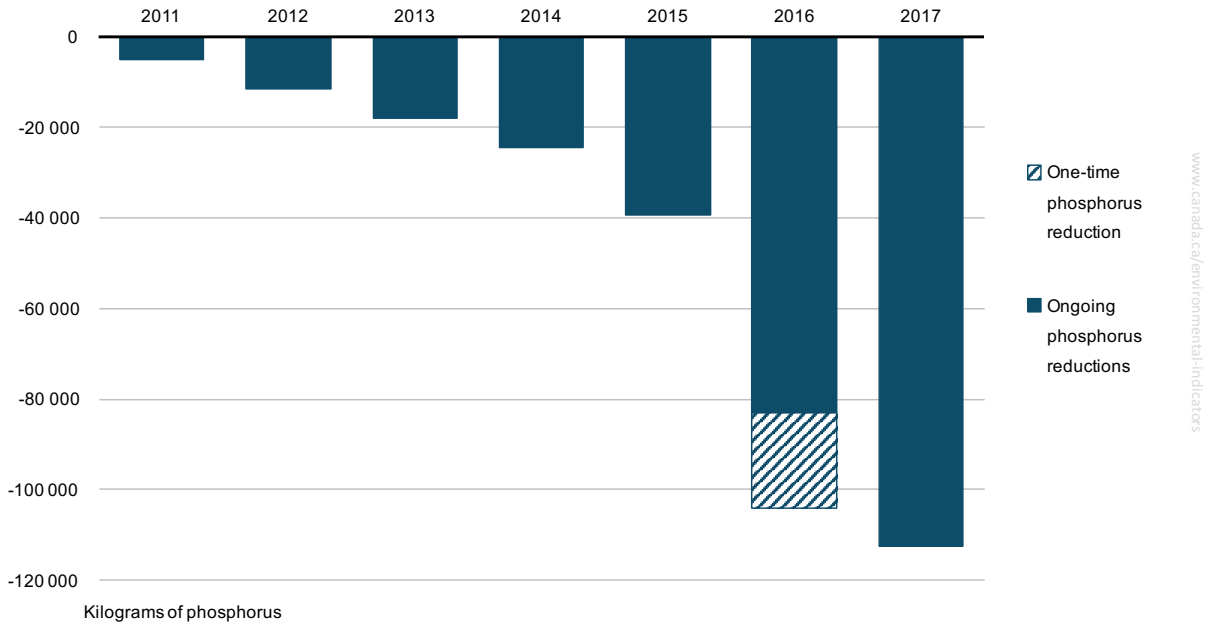
NUTRIENTS IN LAKE WINNIPEG

Phosphorus and nitrogen are essential plant nutrients. When phosphorus levels in water become too high, aquatic plant growth can become excessive and harmful. High phosphorus levels can also lead to harmful algal blooms, which can kill animals that use the water and affect human health.

The federal government, Manitoba Sustainable Development and other partners are engaging people in nutrient reducing activities and supporting innovative nutrient reduction demonstration projects and research through the Lake Winnipeg Basin Program.

Stewardship projects supported by the Lake Winnipeg Basin Stewardship Fund were preventing an estimated 29,715 kg of phosphorus per year from entering Lake Winnipeg and its tributary rivers. Since its inception in 2007, the Lake Winnipeg Basin Stewardship Fund has prevented a cumulative total of 112,584 kg of phosphorus from entering Lake Winnipeg. The bioremediation of a retired municipal wastewater lagoon in 2015 prevented 21,315 kg of phosphorus from ever reaching Lake Winnipeg in 2016.

FIGURE B.17 ESTIMATED CUMULATIVE REDUCTION IN THE AMOUNT OF PHOSPHORUS REACHING LAKE WINNIPEG BECAUSE OF STEWARDSHIP PROJECTS, APRIL 2010 TO MARCH 2017



Note: The estimated reduction in phosphorus load is based on the results of projects completed between April 2010 and March 2017. Estimated phosphorus loads for each project type are rounded and then summed to calculate the total. Year refers to fiscal year, which runs from April to March. The year 2017 therefore refers to April 1, 2016 to March 31, 2017.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Nutrients in Lake Winnipeg. [indicator to be updated]. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/nutrients-in-lake-winnipeg.html.

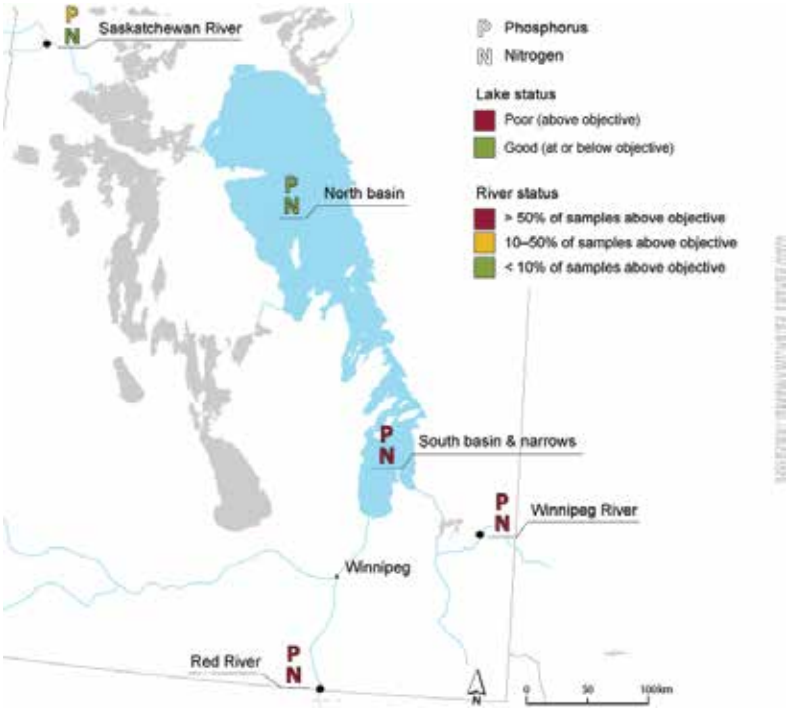
In Lake Winnipeg, the highest levels of phosphorus and nitrogen in 2016 are found in the south basin near the inflow from the Red River. Levels decline as the water flows north.

In the 3 largest tributary rivers, for the 2014 to 2016 period:

- high phosphorus levels were detected frequently in the Red and Winnipeg rivers and intermittently in the Saskatchewan River;
- high nitrogen levels were detected frequently in the Red River and in the Winnipeg River, but rarely in the Saskatchewan River.

Between 1999 and 2016, phosphorus and nitrogen levels fluctuated, but no upward or downward trends were detected at any of the sites.

FIGURE B.18 STATUS OF PHOSPHORUS AND NITROGEN LEVELS IN LAKE WINNIPEG, 2016, AND ITS 3 LARGEST TRIBUTARY RIVERS, CANADA, 2014 TO 2016



Note: For Lake Winnipeg, an objective for total nitrogen of 0.75 milligrams per litre (mg N/L) and an objective for total phosphorus of 0.05 milligrams per litre (mg P/L) were used. For the Red, Winnipeg and Saskatchewan rivers, water quality is considered good when water quality measurements exceed the river's nutrient criteria or objective less than 10% of the time. A fair status is applied when the nutrient criteria or objective is exceeded 10% to 50% of the time. Poor status is applied when measurements are above the nutrient criteria or objective in over 50% of samples.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Nutrients in Lake Winnipeg. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/nutrients-in-lake-winnipeg.html.

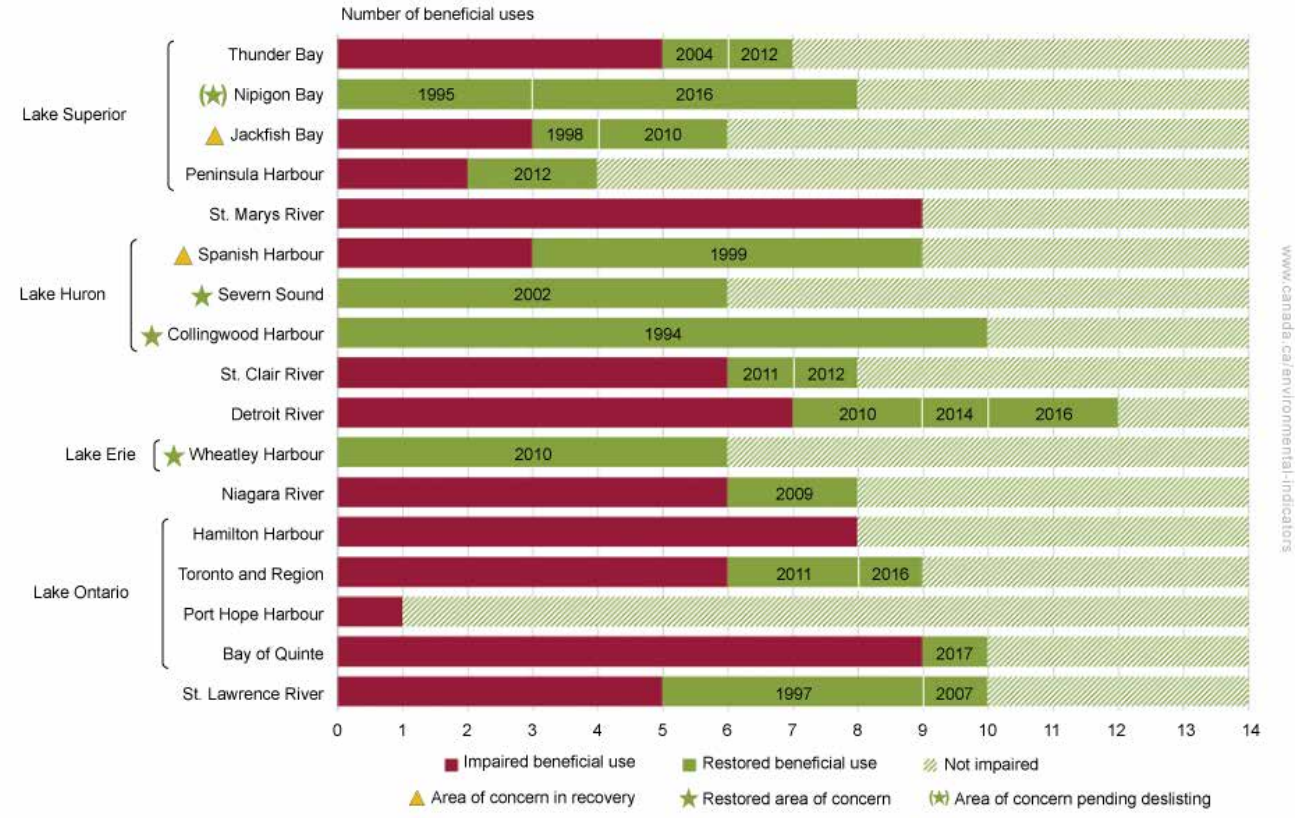
RESTORING THE GREAT LAKES AREAS OF CONCERN

The Great Lakes basin is Canada's most populated region. Its large population and extensive development places a strain on ecosystem health and benefits to people.

The 1987 revision of the Canada–United States Great Lakes Water Quality Agreement identified 43 Areas of Concern in Canadian and American waters of the Great Lakes. Of these, 17 are covering the Canadian Great Lakes and their connecting channels and 5 are shared with the United States.

Environmental quality in Canada's 17 Great Lakes Areas of Concern has improved since the restoration program began in 1987. Within Nipigon Bay, 5 beneficial uses have been restored since 2016, all remedial actions have been completed, and the area is now being proposed for removal from the list of Great Lakes AOCs.

FIGURE B.19 PROGRESS ON CANADIAN GREAT LAKES AREAS OF CONCERN, 1987 TO 2018



Note: The initial assessments were published between 1988 and 1993, with the exception of Wheatley Harbour and Port Hope Harbour, which were produced in 1998 and 2003, respectively. The number of beneficial uses that are impaired for 2018 is based on progress reported as of March 31, 2018.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Restoring the Great Lakes Areas of Concern. [indicator to be updated]. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/restoring-great-lakes-areas-concern.html

METAL MINING EFFLUENT QUALITY

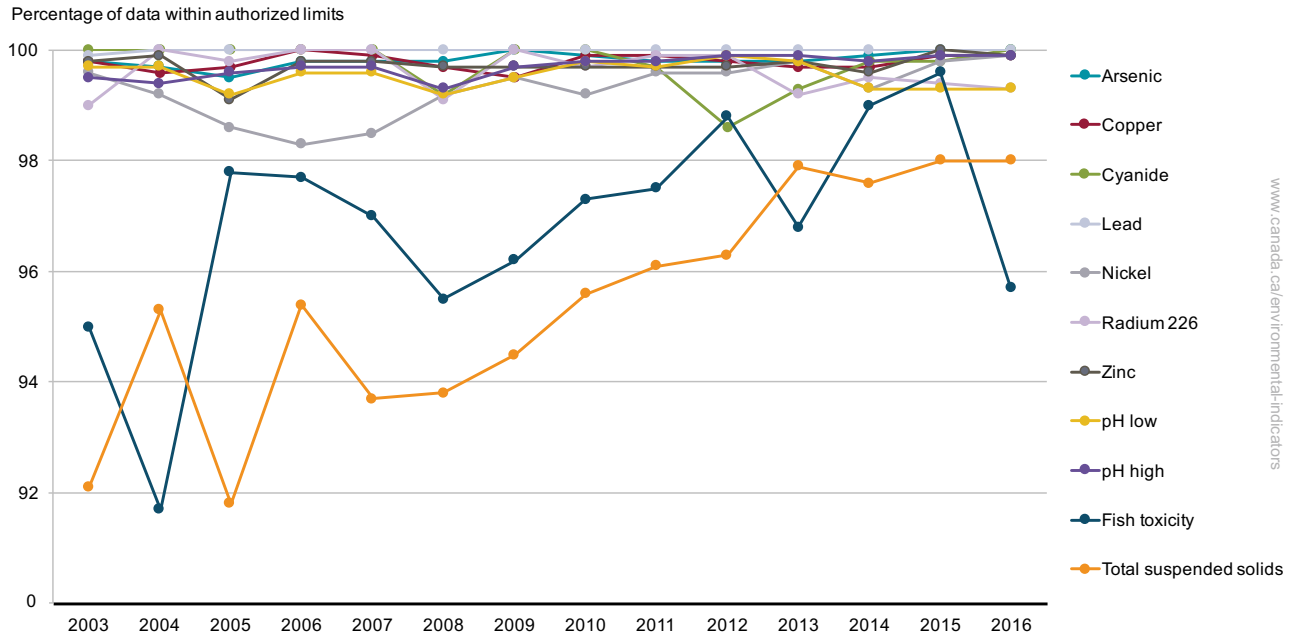
The effects of untreated mining effluent are highly damaging to aquatic environments, fish and fish habitat. Regulations and proper management regimes can mitigate these impacts. The metal mining effluent regulations are designed to protect fish and fish habitat by setting standards for effluent released from metal mines into the environment. Specifically, the regulations prohibit discharge of effluent which is acutely lethal to fish and set limits for pH of effluent and concentrations of arsenic, copper, cyanide, lead, nickel, zinc, radium -226 and total suspended solids.

Since the regulations came into force, the percentage of mining operations meeting regulatory standards for total suspended solids increased from 92.1% to 98%. The compliance with the regulations for fish toxicity varied over the years. While the majority of reporting facilities were compliant with the regulations, the decrease in compliance rates between 2015 and 2016 (99.6% to 95.7%) was mainly due the reported test failures from one facility.

Test results for all other deleterious substances and pH levels ranged from 98.3% to 100% compliance over this time period.

Subject to certain conditions, the regulations permit the deposit of specific deleterious substances from metal mines. They also impose limits on the pH level of the effluent and prohibit the release of effluent that is acutely lethal.

FIGURE B.20 PERCENTAGE OF REGULATORY DATA SUBMITTED BY METAL MINES THAT DID NOT EXCEED AUTHORIZED LIMITS, CANADA, 2003 TO 2016



Note: Deleterious substances listed in the Metal Mining Effluent Regulations include arsenic, copper, cyanide, lead, nickel, zinc, total suspended solids, and radium 226. The regulations set a minimum (pH low) and maximum (pH high) level for the pH of effluent released. Fish toxicity refers to tests of effluent on rainbow trout mortality rate.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Metal mining effluent quality. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/metal-mining-effluent-quality.html.

PULP AND PAPER EFFLUENT QUALITY

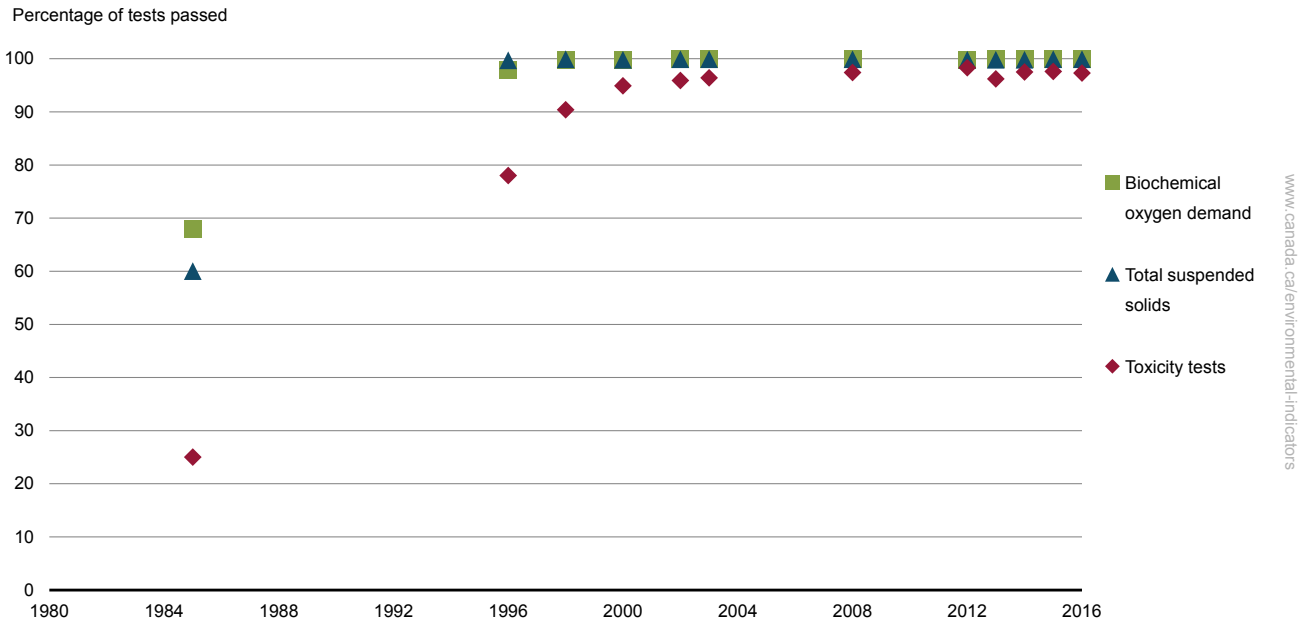
The Pulp and Paper Effluent Regulations (the regulations) were developed under the *Fisheries Act* in 1971 to govern the discharge of deleterious substances into waters frequented by fish.

The regulations were designed to encourage mills to modify their processes in order to improve water quality and protect fish, fish habitat and the use of fisheries resources. They set limits on the amounts of total suspended solids and biochemical oxygen demanding matter, and prohibit deposits of acutely lethal effluent. The Pulp and Paper Effluent Regulations govern the discharge of harmful substances from pulp and paper mills into water frequented by fish.

This indicator shows the results achieved since the mid-1980's under these regulations. Between 1985 and 2016, the quality of pulp and paper effluent released directly into the environment improved.

- Tests for toxicity met regulatory standards 25% of the time in 1985 and 97.3% of the time in 2016.
- In 1985, tests for biochemical oxygen demand and total suspended solids met regulatory standards 68% and 60% of the time, respectively. Both tests met the standards 99.9% of the time in 2016.

FIGURE B.21 PERCENTAGE OF REGULATORY TESTS MEETING REGULATORY STANDARDS BY PULP AND PAPER MILLS, CANADA, 1985 TO 2016 (SELECTED YEARS)



Note: Toxicity tests refer to tests of effluent toxicity on fish. Biochemical oxygen demand refers to the amount of dissolved oxygen needed to break down organic material in water. Total suspended solids includes all particles in water that will not pass through a filter. As levels of biochemical oxygen demand and total suspended solids rise, a water body begins to lose its ability to support aquatic animals.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Pulp and paper effluent quality. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/pulp-paper-effluent-quality.html.

ADDITIONAL INFORMATION ON PRISTINE LAKES AND RIVERS

Canadian Environmental Sustainability Indicators

- Water quality in Canadian rivers
- Water quantity in Canadian rivers
- Restoring the Great Lakes Areas of Concern
- Phosphorus levels in the offshore waters of the Great Lakes
- Nutrients in the St. Lawrence River
- Reducing phosphorus loads to Lake Simcoe and South-eastern Georgian Bay
- Nutrients in Lake Winnipeg
- Pulp and paper effluent quality
- Metal mining effluent quality
- Releases of harmful substances to water
- Risk to soil and water quality from agriculture
- Polybrominated diphenyl ethers in fish and sediment

ANNEX B.8 SUSTAINABLY MANAGED LANDS AND FORESTS

Long-term goal: Lands and forests support biodiversity and provide a variety of ecosystem services for generations to come

FSDS 2016 to 2019 starting point	Latest indicator results	Are we heading in the right direction?
As of 2015, 10.5% of Canada's terrestrial area was protected.	As of 2017, 10.5% of Canada's terrestrial area was protected.	Yes
As of March 2016, the condition of 90% of our indicators was maintained or improved from 2011.	As of March 2018, the ecological integrity of 88% of Canada's national park ecosystems was either stable or improving.	No
In 2015, Canada had 348 million hectares of forest land, the third-largest forest area in the world, and less than 0.02% of that land is deforested annually.	The next publication of data will be in 2020.	
In 2014, 148 million cubic metres of timber was harvested, while the wood supply was 227 million cubic metres.	In 2016, 155 million cubic metres of timber was harvested, while the wood supply was 223 million cubic metres.	Yes

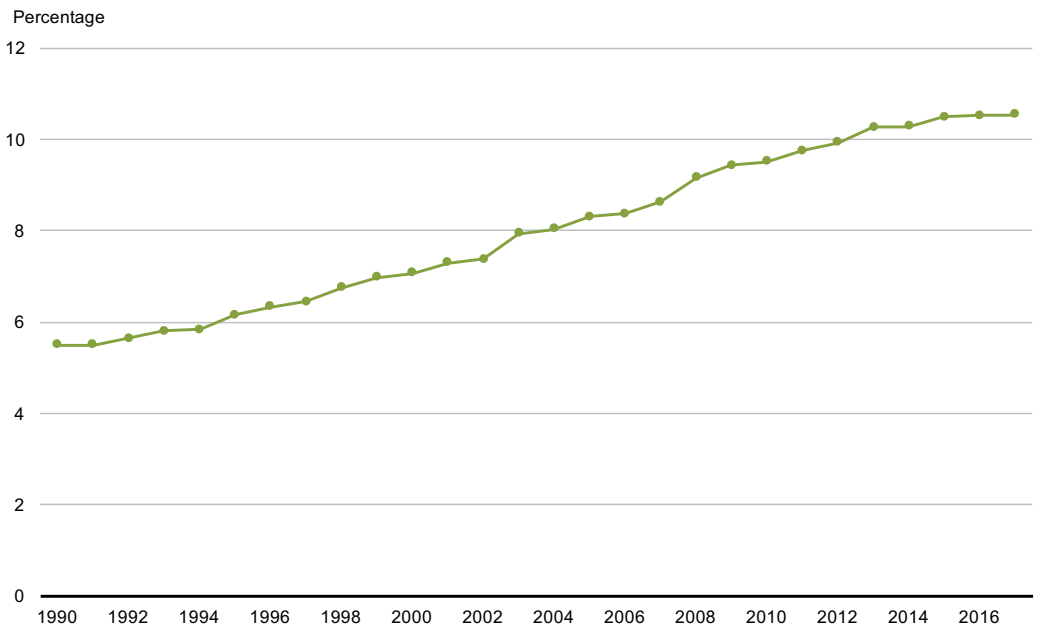
CANADA'S PROTECTED AREAS (TERRESTRIAL)

Well-managed protected and conserved areas are one way to protect wild species and their habitats for present and future generations. Habitat conservation is a measure of human response to the loss of biodiversity and natural habitat. As the conserved area in Canada increases, more lands and waters are withdrawn from direct human development stresses, which contributes to biodiversity conservation and improving the health of ecosystems. In turn, healthy ecosystems provide benefits such as clean water, mitigation of climate change, pollination and improved human health.

As of the end of 2017, 10.5% of Canada's terrestrial area (land and freshwater) was protected, and increase of 64% in the last 20 years and 6% in the last 5 years.

The parties to the Convention on Biological Diversity, among them Canada, have set an aspirational target to conserve at least 17% of terrestrial areas and inland waters, by 2020. Conserved areas include both protected areas together with other conservation measures. An internationally recognized definition of the "other effective area-based conservation measures" to be included in the Convention on Biological Diversity targets has not yet been established. While, Canada has developed domestic criteria for "other effective area-based conservation measures" in the marine realm, it is still in development for the terrestrial areas. It will only be possible to assess the progress towards the target when this definition is agreed upon and implemented.

FIGURE B.22 PROTECTED AREAS, CANADA, 1990 TO 2017



www.canada.ca/environmental-indicators

Note: Terrestrial areas include both land and freshwater. Protected areas include only areas recognized under international standards.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Canada's conserved areas. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/conserved-areas.html.

ECOLOGICAL INTEGRITY OF CANADA'S NATIONAL PARKS

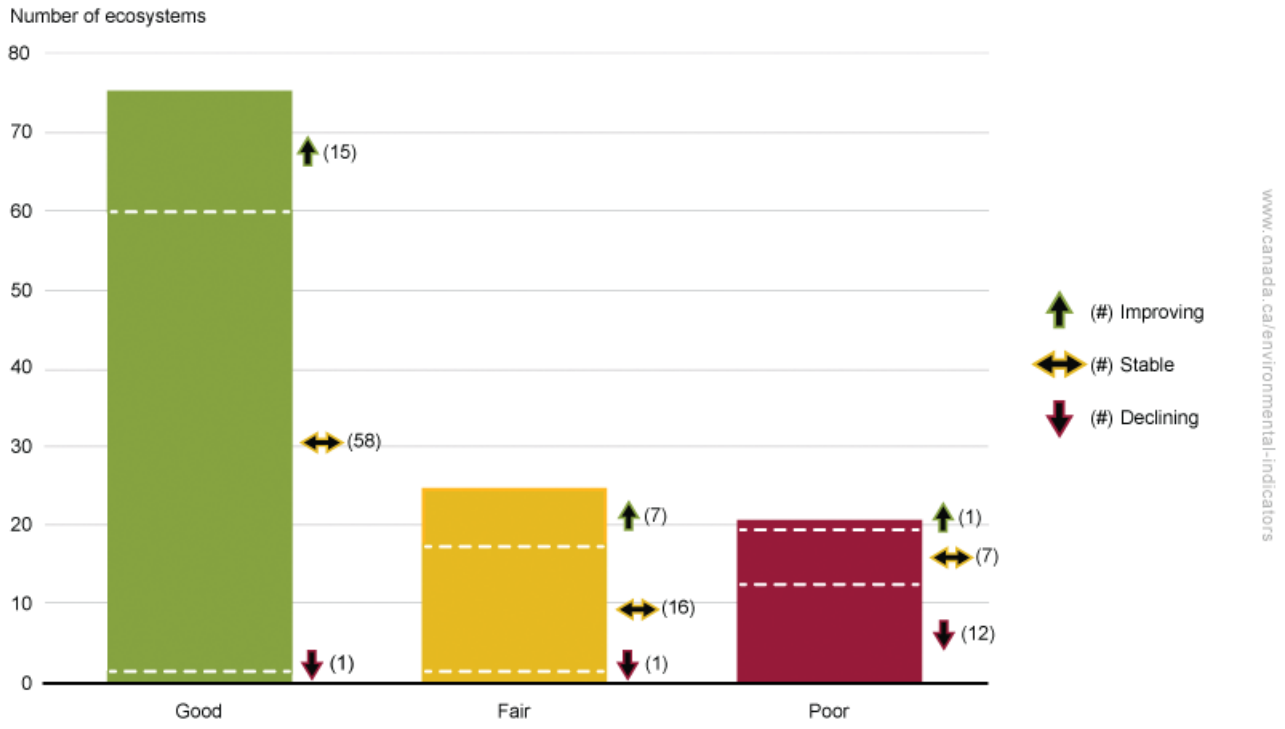
Parks are interlinked with their surrounding ecosystems and, despite their protected status, they are affected by many of the same pressures placed on the environment in general. Climate change and the long-range movement of pollution affect ecosystems inside and outside parks.

Ecosystems have integrity when their native species, landscapes and functions are intact. The ecological integrity of national parks is assessed by monitoring representative components of major park ecosystems, such as forest, freshwater and wetlands. It is a key measure of the condition of Canada's national parks.

- Of the 118 ecosystems in 42 national parks that were assessed, 63% are in good condition and 20% are in fair condition. The remaining 17% are in poor condition.
- Most park ecosystems are stable (81 of 118 or 69%), 23 have improving trends, and 14 have declining trends. Most of the ecosystems that improved were forest or freshwater systems (14 systems). Most of the declining ecosystems were freshwater or tundra (9 systems).

The ecosystems respond differently to stressors, and they also respond differently to management actions. Some management actions may take many years to show results, particularly for slow-growing vegetation.

FIGURE B.23 ECOLOGICAL INTEGRITY STATUS AND TRENDS OF ECOSYSTEMS IN 42 NATIONAL PARKS, CANADA, 2017



Note: Park ecosystems may include forest, freshwater, wetlands, grasslands, shrublands, tundra, coastal/marine and glaciers, depending on what is present in each park. Akami-Uapishkᵁ-KakKasuak-Mealy Mountains, and Nááts'ihch'oh National Park Reserves and Auyuittuq and Qausuittuq National Parks did not report ecological integrity indicators in 2017. Rouge National Urban Park has also not yet reported.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Ecological integrity of national parks. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/ecological-integrity-national-parks.html.

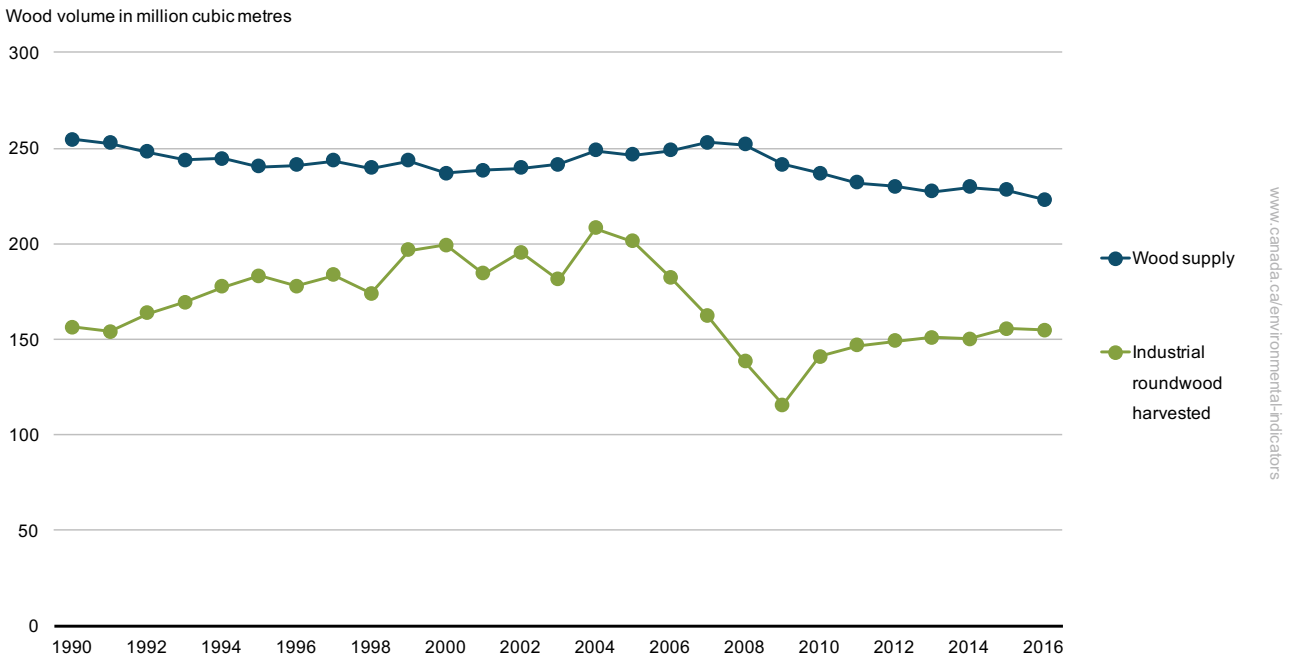
SUSTAINABILITY OF TIMBER HARVEST

About 38% of Canada's area is covered in forests. Timber harvest is an important part of the Canadian economy. To ensure that forests can continue to provide timber, the harvests must remain below sustainable limits. The maximum sustainable harvest is known as the wood supply. The indicator compares the amount of timber harvested with the wood supply.

Between 1990 and 2016 timber harvest in Canada ranged from 48% to 84% of the estimated wood supply. Canada's wood supply has remained relatively stable since 1990 at an average of about 240 million cubic meters.

The harvest of industrial roundwood reached a peak of 208 million cubic metres in 2004, declined to a low of 116 million cubic metres in 2009, then increased to reach 155 million cubic metres in 2016. This pattern is the result of economic factors, such as reduced demand for Canadian lumber due to the global economic downturn and the collapse in the United States housing market, and reduced global demand for Canadian pulp and paper products. There has been some recovery in recent years as the global economy has improved.

FIGURE B.24 WOOD SUPPLY AND ANNUAL HARVEST OF INDUSTRIAL ROUNDWOOD, CANADA, 1990 TO 2016



Note: Wood supply and annual harvest data presented are both for industrial roundwood only.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Sustainability of timber harvest. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/sustainability-timber-harvest.html.

SIZE OF CANADIAN FOREST: DEFORESTATION

Deforestation is an important issue, since shrinking forest cover reduces biodiversity, affects soil and water quality, impacts wildlife habitat and influences climate change. The Canadian government carefully monitors and regularly publishes reports on deforestation.

Deforestation is used to track the land-use changes through which forest land is converted for other purposes. Rates of annual deforestation in Canada have historically been very low, and continue to decline. Between 2010 and 2015, there was an overall decline of 6% in national deforestation. Sectors that have contributed to this decrease through reduced forest land conversion include agriculture, road construction and hydroelectric development.

TABLE B.3 ESTIMATED AREA (HECTARES) OF ANNUAL DEFORESTATION IN CANADA, BY INDUSTRIAL SECTOR, 2005, 2010 AND 2015

Sector	Year		
	2005	2010	2015
Agriculture	18,000	12,300	12,300
Forestry*	3,400	1,400	1,400
Hydroelectric	800	1,900	900
Mining	3,000	3,600	3,200
Oil & Gas	11,100	9,900	9,800
Transportation	2,800	2,600	1,900
Industry	1,000	1,200	1,200
Municipal	4,600	3,200	3,200
Recreation	600	300	300
TOTAL	**45,400**	**36,300**	**34,100**

Note: Forestry numbers (*) result from the creation of permanent forestry access roads.

Source: Natural Resources Canada. The State of Canada's Forests, Annual Report 2017, p.28. Available online at: www.nrcan.gc.ca/forests/report/area/16546.

ADDITIONAL INFORMATION ON SUSTAINABLY MANAGED LANDS AND FORESTS

Canadian Environmental Sustainability Indicators

- Canada's protected areas
- Ecological integrity of national parks
- Sustainability of timber harvest

Natural Resources Canada – Forest Resources Portal

- Natural Resources Canada – Forest Resources

Natural Resources Canada, Forest Topics Portal

- www.nrcan.gc.ca/forests/topics/13505

Natural Resources Canada, The State of Canada's Forests Annual Report 2017

- The State of Canada's Forests Annual Report 2017

The National Forestry Database: Canada's Compendium of Forestry Statistics, National Forestry Database

- National Forestry Database

The Canadian Council on Ecological Areas (CCEA), Conservation Areas Reporting and Tracking System (CARTS)

- Conservation Areas Reporting and Tracking System (CARTS)

Forest Regeneration

- http://cfs.nrcan.gc.ca/pubwarehouse/pdfs/38871.pdf (see page 32)

Conservation 2020

- For information on the pan-Canadian project to achieve Canada Target 1, including the work of the Indigenous Circle of Experts, and National Advisory Panel, visit the Pathway to Canada Target 1 website

ANNEX B.9 HEALTHY WILDLIFE POPULATIONS

Long-term goal: All species have healthy and viable populations

FSDS 2016 to 19 starting point	Latest indicator results	Are we heading in the right direction?
Among wild species assessed in 2010, 77% were ranked “secure”.	Among wild species assessed in 2015, 80% were ranked “secure” or “apparently secure”.	Yes
As of May 2015: 688 wildlife species had been assessed as endangered, threatened or of special concern; of the 436 species that had been assessed more than once 66% showed no change between the two most recent assessments, 14% were in a lower risk category and 19% were in a higher risk category.	As of May 2017, 995 wildlife species have been assessed by the Committee on the Status of Endangered Wildlife in Canada (the Committee) and given a risk designation. Of the 455 species that had been assessed more than once 65% showed no change between the two most recent assessments, 18% were in a lower risk category and 18% were in a higher risk category.	Yes
As of May 2015, of the 112 species at risk with recovery strategies or management plans in place, and whose population oriented goals had been reassessed, 38% showed population trends consistent with the goals of the recovery strategies.	As of May 2017, of the 113 species at risk with recovery strategies or management plans in place, and whose population oriented goals had been reassessed, 43% showed population trends consistent with the goals of the recovery strategies.	Yes
In 2013, 57% of managed migratory bird species regularly found in Canada had acceptable populations.	More recent data unavailable for this reporting cycle. Data will be available in 2019.	

SPECIES AT RISK POPULATION TRENDS

Some wildlife species in Canada are at risk of extinction. For many of these species, population objectives are set out in a recovery document. In general, successful recovery of species should arrest or reverse any unnatural decline and remove or mitigate anthropogenic pressures in order to improve or stabilize the likelihood of the species’ persistence in the wild. This indicator presents early signs of progress and provides a preliminary assessment of whether recovery efforts are working, recognizing that recovery may take many years.

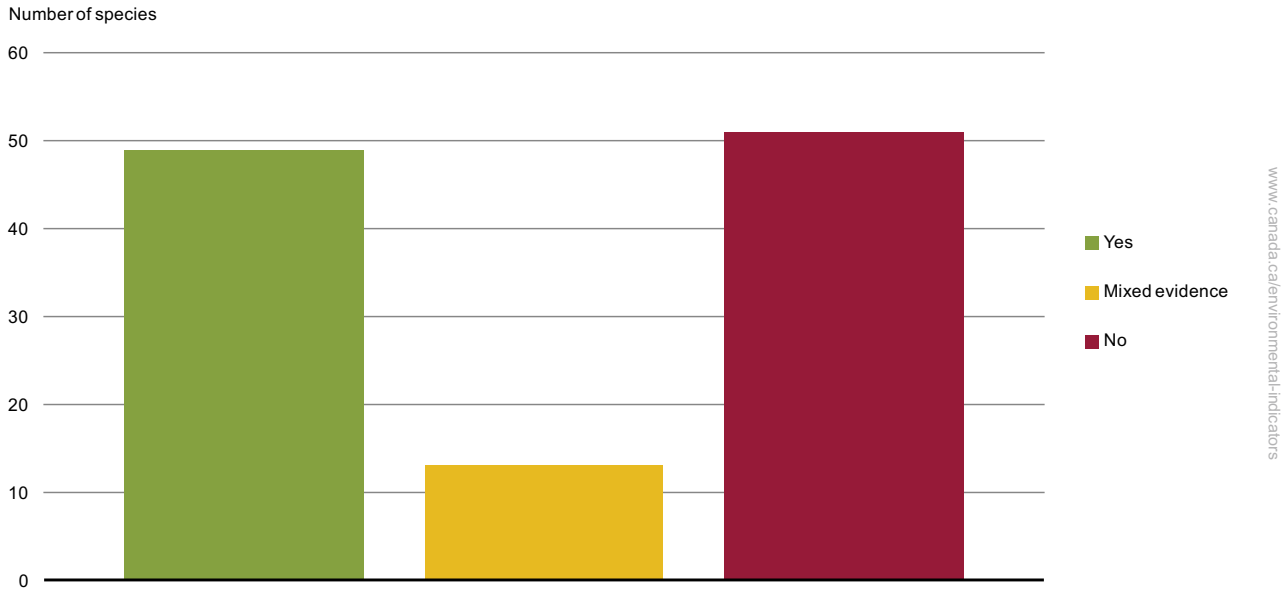
Of the 378 species at risk that had final recovery strategies or management plans as of May 2017, 113 species have population-oriented objectives and have been reassessed by the Committee on the Status of Endangered Wildlife in Canada since their recovery documents were finalized. Of these 113 species, 49 (43%) have population trends that are consistent with the objectives laid out in the recovery documents and 51 (45%) show trends that are inconsistent with the objectives.

Since May 2015, 11 species have been added to this indicator:

- 6 show trends that are inconsistent with the objectives;
- 2 have mixed evidence; and
- 3 did not have sufficient data to determine trends.

Species that are at risk can take a long time to recover. Recovery of species is related to, among other factors, their life span, reproductive cycle, and the state of their habitat. In addition, observations of rare species are often difficult to collect. The indicator results should not be interpreted as a measure of recovery success until sufficient time has passed to allow species to recover and to collect sufficient information to assess that recovery.

FIGURE B.25 ARE POPULATION TRENDS OF SPECIES AT RISK CONSISTENT WITH THE OBJECTIVES? CANADA, MAY 2017



Note: Categories account for the amount of time that has been available for recovery. Mixed evidence means that there is a mix of positive and negative population trends. There are also 30 species for which recovery objectives and reassessments have been prepared, but insufficient evidence is available in the reassessment to assess trends.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Species at risk population trends. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/species-risk-population-trends.html.

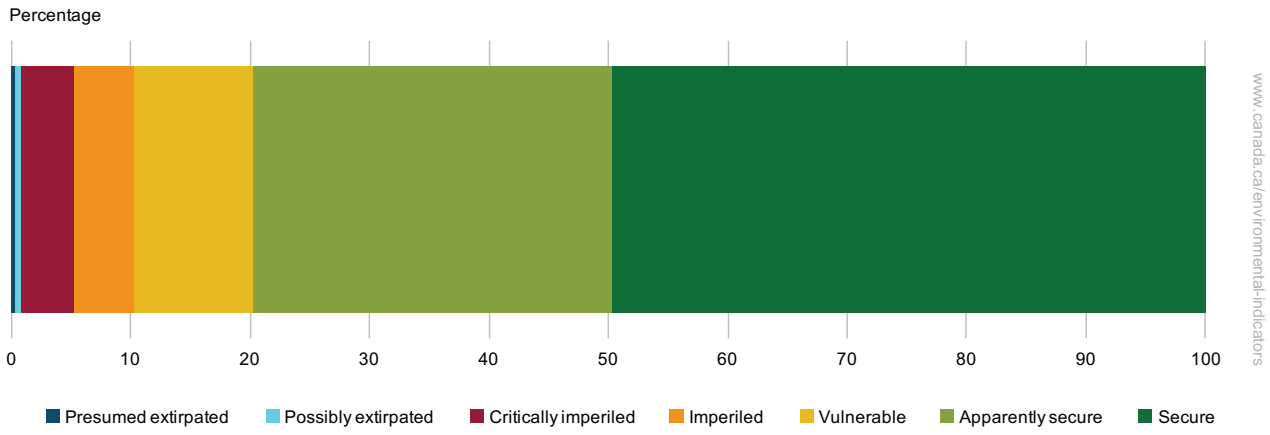
STATUS OF WILD SPECIES

The Wild Species 2015 report assessed the conservation status of 29,848 species in 34 species groups. Of the species assessed, 16,078 native species were assigned a national extinction risk level.

- 80% or 12,833 species are ranked as secure or apparently secure;
- 20% or 3120 species are vulnerable, imperiled or critically imperiled; and
- Less than 1% or 125 species are no longer found in Canada.

The status of wild species has been assessed every 5 years since 2000. Between 2000 and 2015, the proportion of species ranked as secure varied between 70% and 80%. This variation is due mainly to the assessment of additional species.

FIGURE B.26 NATIONAL CONSERVATION STATUS OF NATIVE WILD SPECIES, CANADA, 2015



Note: The ranking system developed by NatureServe, an international network of over 80 conservation data centers, is used.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Status of wild species. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/status-wild-species.html.

CHANGES IN WILDLIFE SPECIES DISAPPEARANCE RISKS

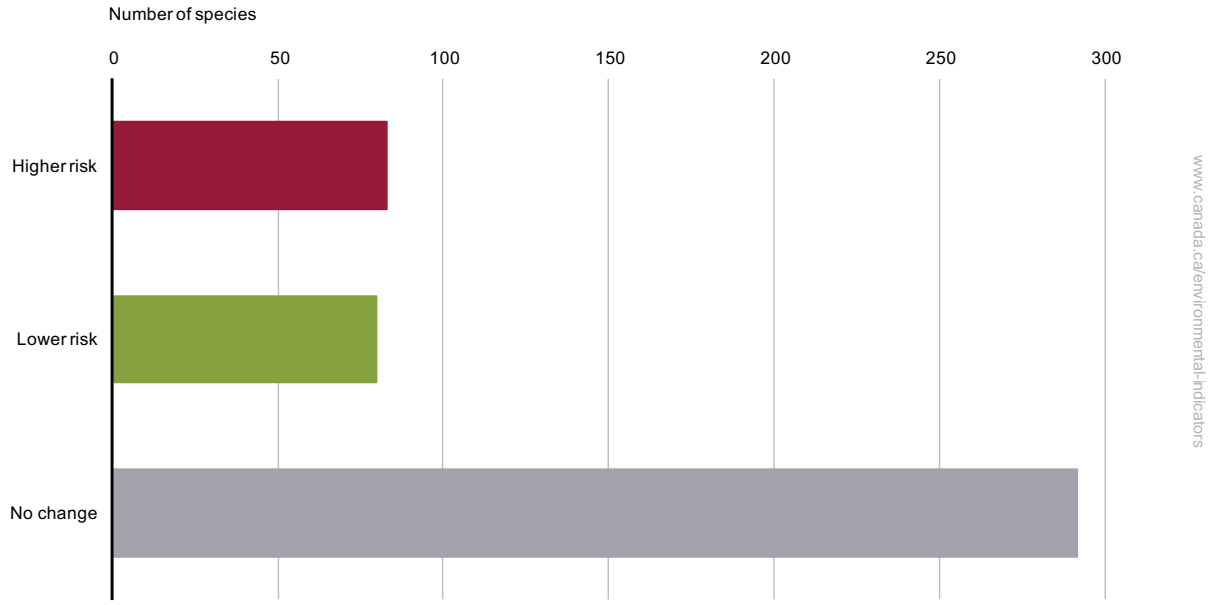
Wildlife species are essential to the integrity of ecosystems. However, some wildlife species are at risk of disappearing from Canada. Wildlife species that are thought to be at risk are periodically assessed. Changes in status over time may help determine whether conditions for these wildlife species are improving.

As of May 2017, of the 455 wildlife species for which sufficient data are available to determine if there has been a change in status:

- 83 wildlife species (18%) are now in a higher risk category;
- 80 wildlife species (18%) are now in a lower risk category; and
- 292 wildlife species (65%) show no change in status.

Most wildlife species remain in the same category when they are reassessed. The changes that are observed most often occur between neighboring categories.

FIGURE B.27 CHANGES IN RISK OF DISAPPEARANCE OF WILDLIFE SPECIES FROM CANADA, MAY 2017



Note: In this analysis, wildlife species refers to a species, subspecies or a genetically or geographically distinct population. Wildlife species disappearance may refer to extinction or extirpation (an extirpated species no longer exists in the wild in Canada).

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Changes in the status of wildlife species at risk. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/changes-status-wildlife-species-risk.html.

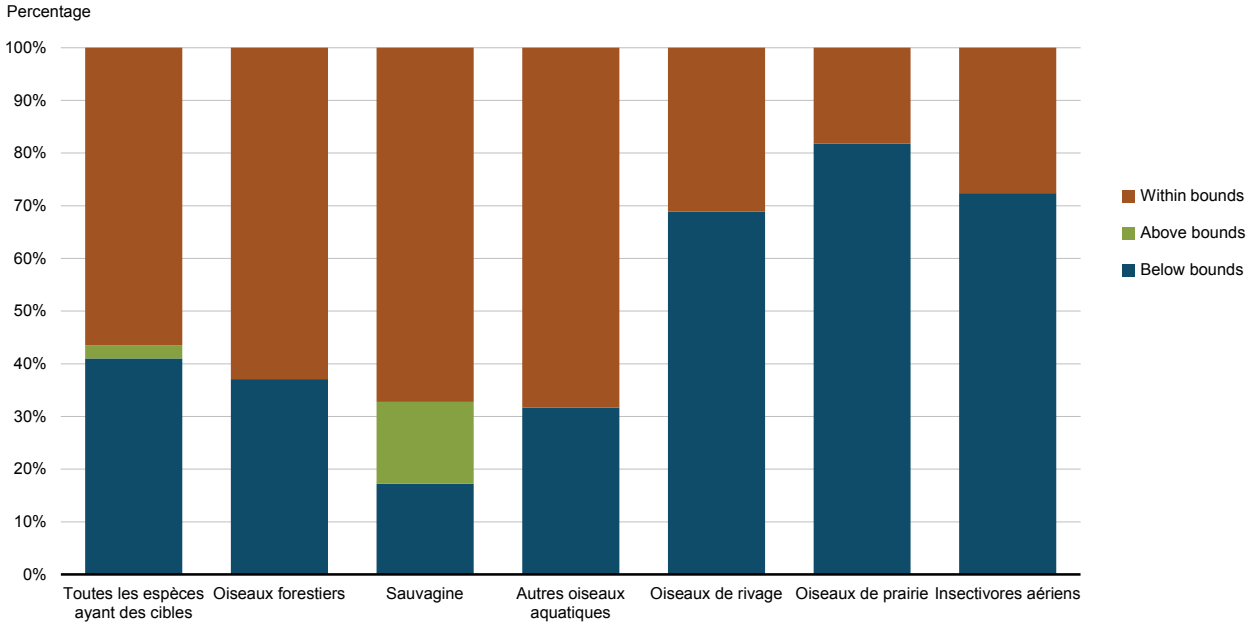
POPULATION STATUS OF CANADA'S MIGRATORY BIRDS

Canada's bird populations have been heavily influenced by human activity, in ways that have helped some species and hindered others.

Of the managed migratory species (368 with adequate monitoring data) regularly found in Canada, 57% (208 species) have population sizes within an acceptable range, and 43% (160) do not.

The proportion of species with acceptable population sizes varies between ecological groups. For example, most waterfowl (67%) and forest bird species (63%) are within acceptable ranges, but grassland birds (18%) and aerial insectivores (birds that catch insects while in flight, 28%) have lower proportions of species with acceptable population levels.

FIGURE B.28 POPULATION STATUS OF MIGRATORY BIRDS, CANADA, 2013



www.canada.ca/environmental-indicators

Note: Species groups are as in State of Canada's Birds but include only species addressed in the *Migratory Birds Convention Act* (MBCA). Fifty-three species lack sufficient data to be assessed. "Species" as used here may include subspecies or populations of relevance to management. Species groups are as in State of Canada's Birds; note that, of the 420 species considered here, 70 cannot be classified into the ecological groups and therefore do not appear in any group. Examples include habitat generalists that use both forest and grassland. Aerial insectivores are shown separately but are also included in other groups.

Source: Environment Canada (2015) Canadian Environmental Sustainability Indicators: Population *Status of Canada's Migratory Birds*. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/population-status-migratory-birds.html.

ADDITIONAL INFORMATION ON WILDLIFE POPULATIONS

Canadian Environmental Sustainability Indicators

- Wildlife and Habitat Indicators
- Species at risk population trends
- Population status of Canada's migratory birds
- Status of wild species
- Changes in the status of wildlife species at risk
- Canadian species index

Canada's National Reporting to the Convention on Biological Diversity (CBD)

- Canada's 5th National Report to the CBD
- Canada's 6th National Report to the CBD (due December 2018)

E-bird Canada

- E-Bird Canada

Bird Studies Canada, Christmas Bird Count

- Christmas Bird Count

The North American Bird Conservation Initiative

- State of North America's Birds 2016

Bird Studies Canada, Breeding Bird Survey

- Breeding Bird Survey

ANNEX B.10 CLEAN DRINKING WATER

Long-term goal: All Canadians have access to safe drinking water and, in particular, the significant challenges Indigenous communities face are addressed

FSDS 2016 to 2019 starting point	Latest indicator results	Are we heading in the right direction?
In 2015, based on a subset of Canadian jurisdictions, 78% of advisories were issued as a precaution.	In 2017, based on a subset of Canadian jurisdictions, 83% of advisories were issued as a precaution due to equipment or process-related problems.	Yes
The number of long-term drinking water advisories affecting First Nations drinking water systems financially supported by Indigenous and Northern Affairs Canada was 78 as of April, 2016.	Of the 78 long-term drinking water advisories affecting First Nations water systems at the end of April 2016, 34 (44%) long-term drinking water advisories were removed as of July 2018.	Yes

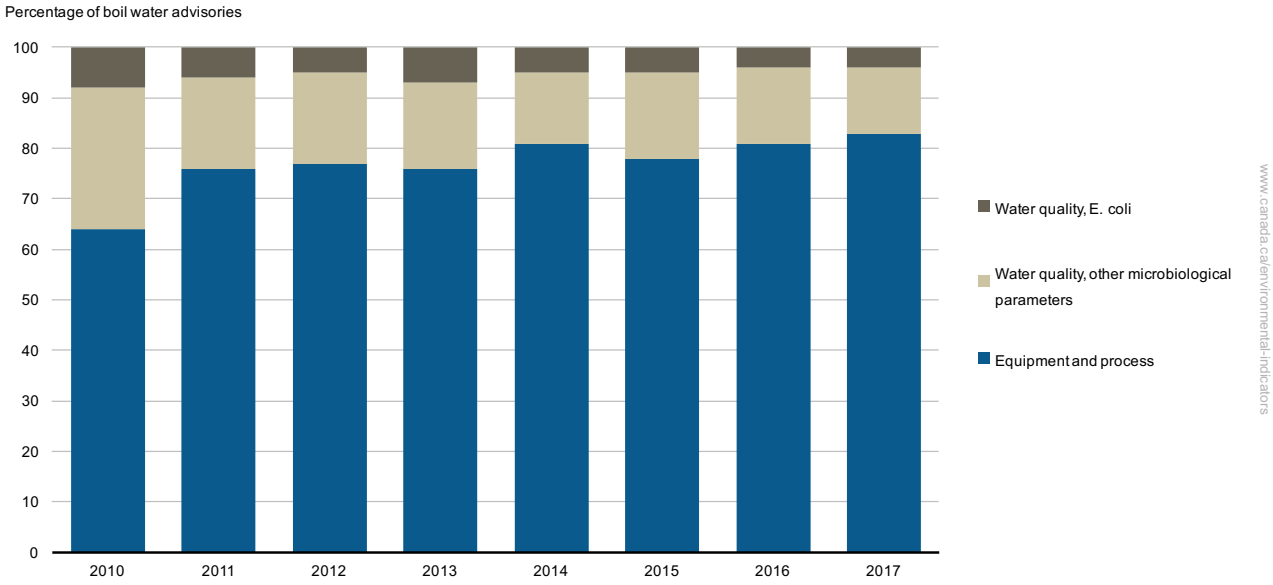
DRINKING WATER ADVISORIES IN CANADA

Drinking water advisories are public health protection messages issued by public health or regulatory authorities to inform consumers about actions they should take to protect themselves from real or potential health risks related to their drinking water supply. Boil water advisories are by far the most common type of advisory. They are issued when the microbiological quality of drinking water is suspected or confirmed to be compromised, meaning disease-causing micro-organisms, such as bacteria, viruses or parasites, could be in the drinking water. “Do not consume” and “Do not use” advisories represent approximately 2% of all drinking water advisories in Canada annually.

In 2017, 83% of boil water advisories in Canada were issued on a precautionary basis due to problems with drinking water equipment or processes. By contrast, boil water advisories issued due to the detection of Escherichia coli (E. coli) in drinking water samples accounted for 4%. Boil water advisories related to other microbiological water quality parameters, such as the detection of total coliform bacteria or unacceptable turbidity levels, accounted for 13% of total boil water advisories.

Between 2010 and 2017, the number of boil water advisories issued on a precautionary basis, due to problems with equipment or processes used to treat, store or distribute drinking water break down, require maintenance, or have been affected by environmental conditions, increased.

FIGURE B.29 CAUSES OF BOIL WATER ADVISORIES, CANADA, 2010 TO 2017



Note: Data used in this indicator come from various agencies and jurisdictions across Canada that use or share information with the Canadian Network for Public Health Intelligence’s Drinking Water Advisories application. They represent only a subset (less than 50%) of the Canadian population. Comprehensive national data are not available. See this indicator’s Data sources section for more detail. The Water quality, other microbiological parameters category includes detection of total coliform bacteria and high turbidity levels in drinking water systems. Equipment and process category includes issues such as broken water mains, planned system maintenance, power failures or equipment problems.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Drinking water advisories. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/drinking-water-advisories.html.

NUMBER OF LONG-TERM DRINKING WATER ADVISORIES AFFECTING FIRST NATIONS DRINKING WATER SYSTEMS FINANCIALLY SUPPORTED BY INDIGENOUS SERVICES CANADA

Long-term drinking water advisories are those that last one year or longer in duration.

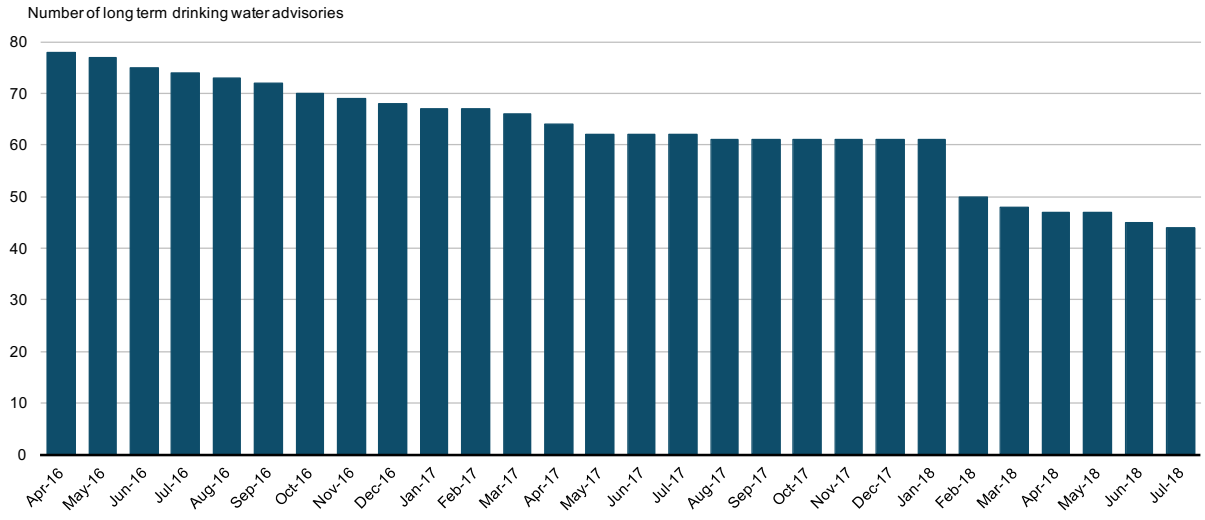
As of April 2016, 78 long-term drinking water advisories were included in the Government of Canada's commitment to eliminating all long-term water advisories affecting First Nations water systems by 2021.

Of the 78 long-term drinking water advisories affecting First Nations water systems financially supported by Indigenous Services Canada (ISC) at the end of April 2016, as of July 2018, 34 (44%) of long-term drinking water advisories were removed.

This indicator is restricted to an original set of about 800 drinking water systems financially supported by ISC in First Nations communities and does not include the set of about 250 additional public drinking water systems added January 23, 2018 to be part of the government's commitment to ensure the lifting of all long term drinking water advisories on reserve by 2021.

The Government of Canada continuously updates the total number of long-term drinking water advisories affecting First Nations publicly funded water systems (including an expanded scope of water systems). For the latest numbers, please visit Indigenous Services Canada's website.

FIGURE B.30 PROGRESS ON THE 78 LONG-TERM DRINKING WATER ADVISORIES AFFECTING FIRST NATIONS AS OF APRIL 2016



Note: The 78 is a corrected number relative to the baseline of 77 mentioned in 2016 to 2019 Federal Sustainable Development Strategy.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Number of long-term drinking water advisories affecting First Nations water systems. Available at: canada.ca/en/environment-climate-change/services/environmental-indicators/drinking-water-advisories-first-nations.html.

ANNEX B.11 SUSTAINABLE FOOD

Long-term goal: Innovation and ingenuity contribute to a world-leading agricultural sector and food economy for the benefit of all Canadians

FSDS 2016 to 2019 starting point	Latest indicator results	Are we heading in the right direction?
In 2011, the Soil Quality Agri-Environmental Performance Index results for Canada's farming regions were within the "good" range (77) and the Water Quality index was also rated as "good" (74).	No update available at the time of publication. Next data update with be 2021.	
Between 2011 and 2014, aquaculture operator's compliance was over 99%.	In 2015 and 2016, the annual compliance rate of inspected aquaculture operations with *Fisheries Act* regulations was 100%.	Yes

WATER QUALITY AND SOIL QUALITY AGRI-ENVIRONMENTAL METRICS

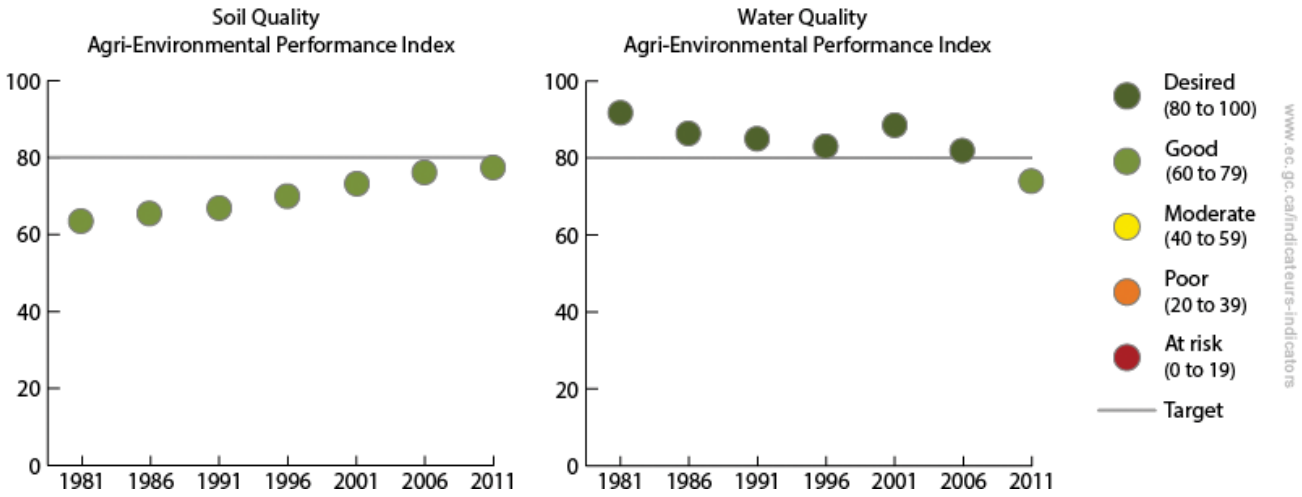
The Soil Quality Agri-Environmental Performance Index combines information about the risk of soil erosion, contamination by trace elements, the risk of salinization and the level of organic matter in the soil. The index's improvement has largely occurred through the adoption of reduced-till and no-till farming practices, and a decline in summer fallowing particularly in the Prairies. In eastern Canada, higher rainfall supports more intensive crop production. When coupled with a higher, but declining, reliance on conventional tillage practices, soils in this region may be more affected by agriculture.

Between 1981 and 2011, changes in farm management have helped improve agriculture's soil quality performance. The Soil Quality Agri-Environmental Performance Index results for Canada's farming regions were showing an upwards trend. While still rated as good, the Water Quality Agri-Environmental Performance Index had fallen below the desired level. The Risk to Soil and Water Quality from Agriculture indicator was last updated in July 2016 with 2011 data. Because the indicator data are drawn from the Census of Agriculture, the Soil and Water Quality Agri-Environmental Performance Indices are updated every 5 years, following census years. The latest data year available at the time this report was updated was 2011, and this report was published in 2016.

The Water Quality Agri-Environmental Performance Index combines information about the risk of water contamination by nitrogen, phosphorus, bacteria and agricultural pesticides. Some of the index's annual variation can be attributed to weather conditions during the year data were collected. As well, greater application of fertilizers and manures on farms in recent decades has increased the opportunities for agricultural nitrogen and phosphorus, as well as bacteria, to reach water bodies. Since 2006, a decrease in perennial crop area and an increase in annual crop area have resulted in an increased use of pesticides and fertilizers and manure, containing nitrogen and phosphorus, increasing the risk of water contamination in some areas.

The index results that show producers are responding to environmental concerns and that progress has been made towards environmental sustainability. Further expansion and intensification of cropping and livestock production due to an increasing demand for food and fibre, or changing business conditions, could increase the environmental pressure from farming unless appropriate actions are taken to mitigate them.

FIGURE B.31 AGRI-ENVIRONMENTAL PERFORMANCE INDICES FOR SOIL AND WATER QUALITY IN CANADA, 1981 TO 2011



Note: The graph's solid horizontal line corresponds to the lowest index value for the desired category. Agriculture and Agri-Food Canada has set a goal for the soil and water quality indices to achieve this level by 2030.

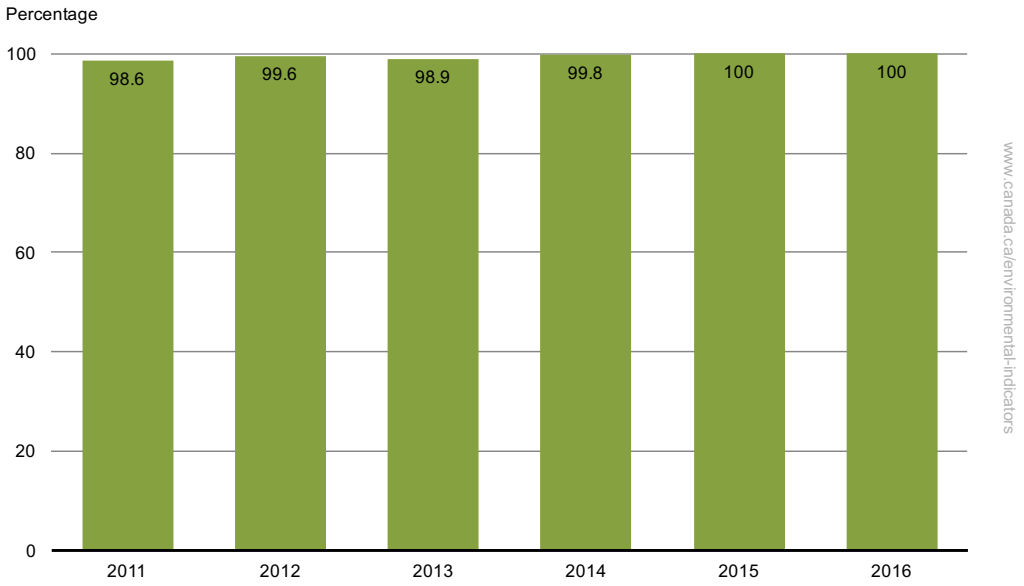
Source: Environment and Climate Change Canada (2016) Canadian Environmental Sustainability Indicators: Risk to Soil and Water Quality from Agriculture. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/risk-soil-water-quality-agriculture.html.

MANAGEMENT OF CANADIAN AQUACULTURE

Fishery officers conduct inspections to validate licence reporting, and to determine whether there is compliance with aquaculture licences, conditions of licence, and other applicable legislation. When necessary, fishery officers respond to complaints and conduct investigations. In addition, the Department of Fisheries and Oceans promotes compliance through public education and awareness activities to encourage all Canadians to protect fishery resources and habitats.

Aquaculture operators' compliance with environmental standards helps to protect our aquatic environment. The indicator provides a measure of how well aquaculture operators meet environmental protection standards related to the sector as set out in the *Fisheries Act* regulations. From 2011 to 2016, the annual compliance rate of inspected aquaculture operations with *Fisheries Act* regulations was over 98%. For the last 2 years, 100% of inspected aquaculture operations were compliant.

FIGURE B.32 COMPLIANCE RATES OF INSPECTED AQUACULTURE OPERATIONS WITH *FISHERIES ACT* REGULATIONS, CANADA, 2011 TO 2016



Note: The compliance rate is the percentage of visits by federal fishery officers where no charges are issued.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Management of Canadian aquaculture. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/management-canadian-aquaculture.html

ADDITIONAL INFORMATION ON SUSTAINABLE FOOD

Canadian Environmental Sustainability Indicators

- Wildlife habitat capacity on agricultural land
- Management of Canadian aquaculture
- Risk to soil and water quality from agriculture
- Status of major fish stocks
- Sustainable fish harvest

Agriculture and Agri-Food Canada, Agri-environmental indicators

- Environmental Sustainability of Canadian Agriculture: Agri-Environmental Indicator Report Series – Report #4

Department of Fisheries and Oceans Canada, Reports and Research Documents published by CSAS

- Reports and Research Documents published by CSAS

Fisheries and Oceans Canada, Laws, regulations and policies

- Laws, regulations and policies

Department of Fisheries and Oceans Canada. Fisheries Policies and Frameworks, Sustainable Fisheries Framework.

- Sustainable Fisheries Framework

Department of Fisheries and Oceans Canada. Sustainable Fisheries Framework, Sustainability Survey for Fisheries.

- Sustainability Survey for Fisheries

Fisheries and Oceans Canada, Aquaculture Science and Research, Program for Aquaculture Regulatory Research (PARR)

- Program for Aquaculture Regulatory Research (PARR)

ANNEX B.12 CONNECTING CANADIANS WITH NATURE

Long-term goal: Canadians are informed about the value of nature, experiencing nature first hand, and actively engaged in its stewardship

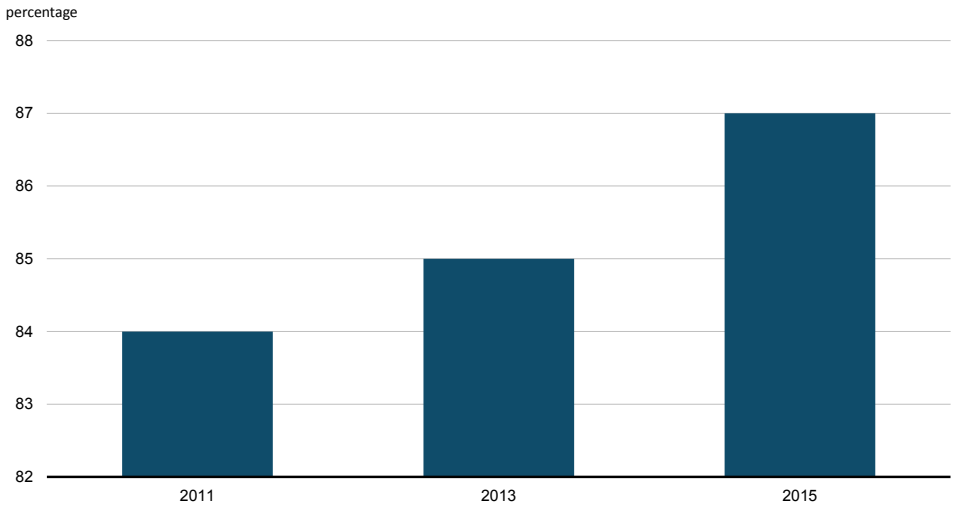
FSDS 2016 to 2019 starting point	Latest indicator results	Are we heading in the right direction?
In 2013, 85% of Canadian households reported that they lived near a park or other green space; and 85% of those reported they visited a park or green space close to their home at least once during the year.	In 2015, 87% of Canadian households visited parks or green space at least once during the year.	Yes
In 2013, 18% of Canadian households engaged in unpaid activities aimed at conservation or protecting the environment or wildlife.	In 2015, 17% of households reported taking action to conserve or protect the environment.	No

TRENDS IN CANADIANS VISITING PARKS OR PUBLIC GREEN SPACES

Parks and green spaces are more than simply a way to beautify neighborhoods and cities. They provide places for people to relax and play outdoors, interact with nature, and are habitats for plants and animals. Ranging in size from small neighborhood parks to large provincial or national parks, they are essential components in healthy environments and beneficial for physical, mental, spiritual, social and environmental health.

In 2015, 87% of Canadian households reported that they live within 10 minutes of a park or green space. In 2015, 87% of Canadian households visited a nearby park or greenspace (up from 84% in 2011).

FIGURE B.33 CANADIAN HOUSEHOLDS THAT VISITED A PARK OR GREEN SPACE THAT WAS CLOSE TO HOME



Source: Statistics Canada (2015) Households and the Environment Survey. Available online at: www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3810002001.

VISITS AT NATURAL HERITAGE PLACES AND TO SELECTED NATIONAL WILDLIFE AREAS

As part of the national celebration of Canada's 150th birthday, visits to national parks and marine conservation areas in 2017-18 were free. Visits were up 9% over total visits in 2016-17. With the exception of historic canals, visits to national historic sites were up 22% over total visits in 2016-17.

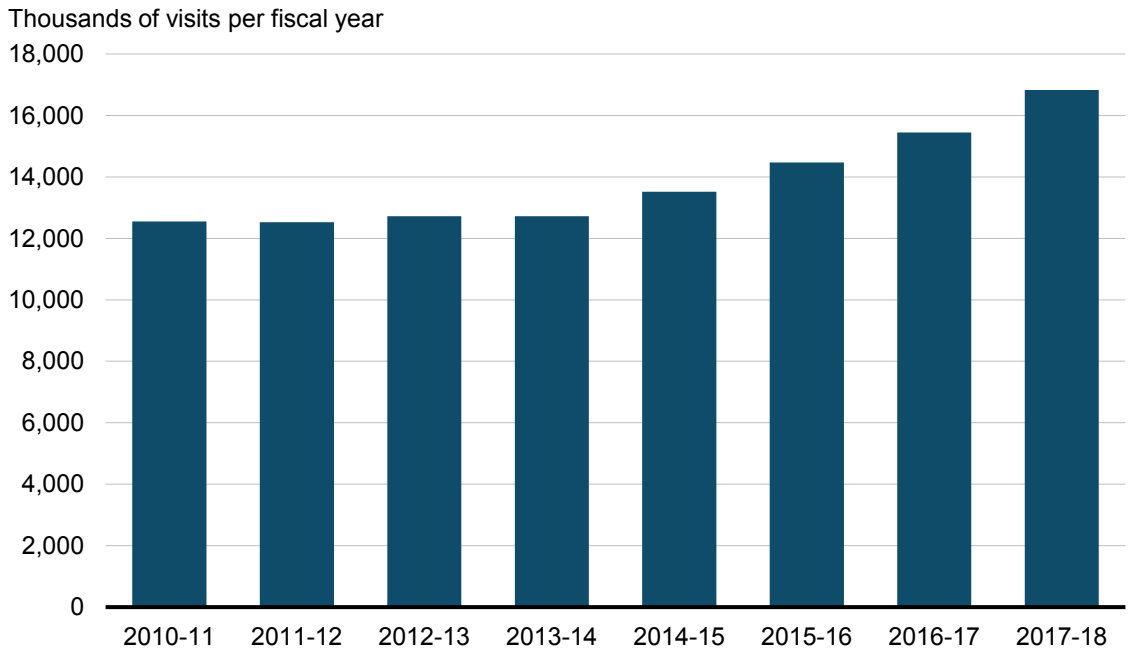
TABLE B.4 ATTENDANCE AT NATIONAL PARKS AND NATIONAL HISTORIC SITES

	2016-17	2017-18	% change 16-17 to 17-18
National Parks	15,449,249	16,833,896	9%
Seven Mountain Parks[A]	8,946,690	9,207,562	3%
Marine Conservation Areas[B]	1,485,881	1,604,533	8%
All other National Parks	5,016,678	6,021,801	20%
National Historic Sites	9,288,024	10,419,484	12%
Historic Canals[C]	3,921,660	3,853,967	-2%
All other National Historic Sites	5,366,364	6,565,517	22%
Totals	24,737,273	27,253,380	10%

Note: [A]The seven mountain parks are Banff, Jasper, Yoho, Kootenay, Waterton Lakes, Mount Revelstoke, Glacier. [B]The marine conservation areas are Fathom Five, Saguenay-St. Lawrence. [C]The historic canals are: St. Peters, Carillon, Chambly, Lachine, Sainte-Anne-de-Bellevue, Saint-Ours, Rideau, Sault Ste. Marie, Trent-Severn Waterway.

Source: Parks Canada, Parks Canada Attendance 2017-2018. Available online at: www.pc.gc.ca/en/docs/pc/attend.

FIGURE B.34 ANNUAL VISITATION TO NATIONAL PARKS AND NATIONAL MARINE AREAS



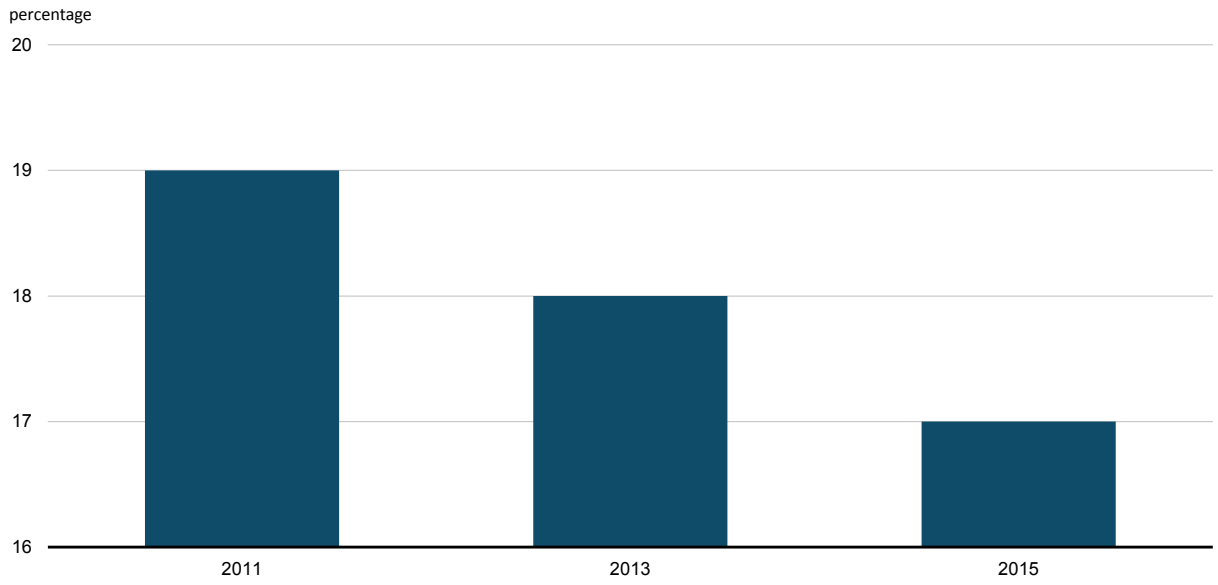
Source: Parks Canada. Available online at: www.pc.gc.ca/en/docs/pc/attend; publications.gc.ca/collections/collection_2017/pc/R61-107-2016-eng.pdf; and publications.gc.ca/collections/collection_2017/pc/R61-107-2012-eng.pdf

CANADIAN HOUSEHOLDS REPORTING ACTION TO PROTECT THE ENVIRONMENT

Environmental engagement activities can be undertaken as part of an organized group or on one's own. Organized activities can include beach or park clean-up days and unpaid help provided to schools, religious organizations, sports or community associations.

The number of Canadian households that take action to conserve or protect the environment or wildlife remained relatively steady between 2011 and 2015 (17% in 2015 and 19% in 2011).

FIGURE B.35 CANADIAN HOUSEHOLDS ENGAGED IN VOLUNTARY CONSERVATION EFFORTS



Source: Statistics Canada (2015) Households and the Environment Survey. Available online at: www150.statcan.gc.ca/t1/tbl1/fr/tv.action?pid=3810002001&request_locale=fr.

ADDITIONAL INFORMATION ON CONNECTING CANADIANS WITH NATURE

Statistics Canada, The Daily: Households and the Environment: Environmental engagement, 2015

- Households and the Environment: Environmental engagement, 2015

Statistics Canada, Data, Parks and green spaces

- Parks and green spaces (Table: 38-10-0020-01)

iNaturalist / The Canadian Wildlife Federation and the Royal Ontario Museum in collaboration with iNaturalist.org at California Academy of Sciences

- I-Naturalist

ANNEX B.13 SAFE AND HEALTHY COMMUNITIES

Long-term goal: All Canadians live in clean, sustainable communities that contribute to their health and well-being

FSDS 2016 to 2019 starting point	Latest indicator results	Are we heading in the right direction?
Emissions of most key air pollutants decreased substantially between 1990 and 2014, including fine particulate matter (16% lower in 2014 than 1990), sulphur oxides (60% lower), nitrogen oxides (19%), volatile organic compounds (36%) and carbon monoxide (53%).	Emissions of most key air pollutants decreased substantially between 1990 and 2016, including fine particulate matter (18% lower in 2016 than 1990), sulphur oxides (65% lower), nitrogen oxides (25%), volatile organic compounds (42%) and carbon monoxide (54%).	Yes
Between 2012 and 2014, outdoor concentrations of fine particulate matter and ground level ozone were generally below the 2015 Canadian Ambient Air Quality Standards.	Between 2014 and 2016, outdoor concentrations of fine particulate matter, ground level ozone, Sulphur dioxide and nitrogen dioxide were below the 2020 Canadian Ambient Air Quality Standards.	Yes
According to the Air Health Indicator, the proportion of two cardiovascular and respiratory disease related deaths attributable to ozone increased between 1990 and 2010, while the proportion attributable to fine particulate matter showed neither an increasing nor decreasing trend between 2001 and 2010.	The proportion of deaths, excluding deaths from injuries, attributable to ozone increased between 1984 and 2012, while the proportion attributable to fine particulate matter between 2001 and 2012 showed neither an increasing nor decreasing trend over the same period.	No
The 2012 to 2013 Canadian Health Measures Survey showed that Canadians had, on average, 0.34 µg/L of cadmium, 11 µg/L of lead and 0.81 µg/L mercury in their blood, and 1.1 µg/L of bisphenol A in their urine.	The 2014–15 Canadian Health Measures Survey showed that Canadians had, on average, 0.31 µg/L of cadmium and 9.5 µg/L of lead in their blood, and 1.0 µg/L of bisphenol A in their urine. (values for mercury were not available since more than 40% of samples were below the limit of detection).	Yes
Monitoring indicates that levels of PBDEs in fish and sediment are decreasing, and that PFOS levels in water and in fish tissue are under reference levels for water quality and fish health.	Between 2013 and 2015, the guideline was exceeded for tetraBDE in Great Lakes fish samples and pentaBDE in fish in the Lower Saskatchewan-Nelson. The situation seems to have deteriorated compared to the 2011-12 samplings. No update was available for PFOS at the time of publication.	No
Between 1990 and 2013, mercury, lead and cadmium emissions to air were reduced by 88%, 90% and 90%, respectively.	Between 1990 and 2016, mercury, lead and cadmium emissions to air were reduced by 88%, 87% and 91%, respectively.	No

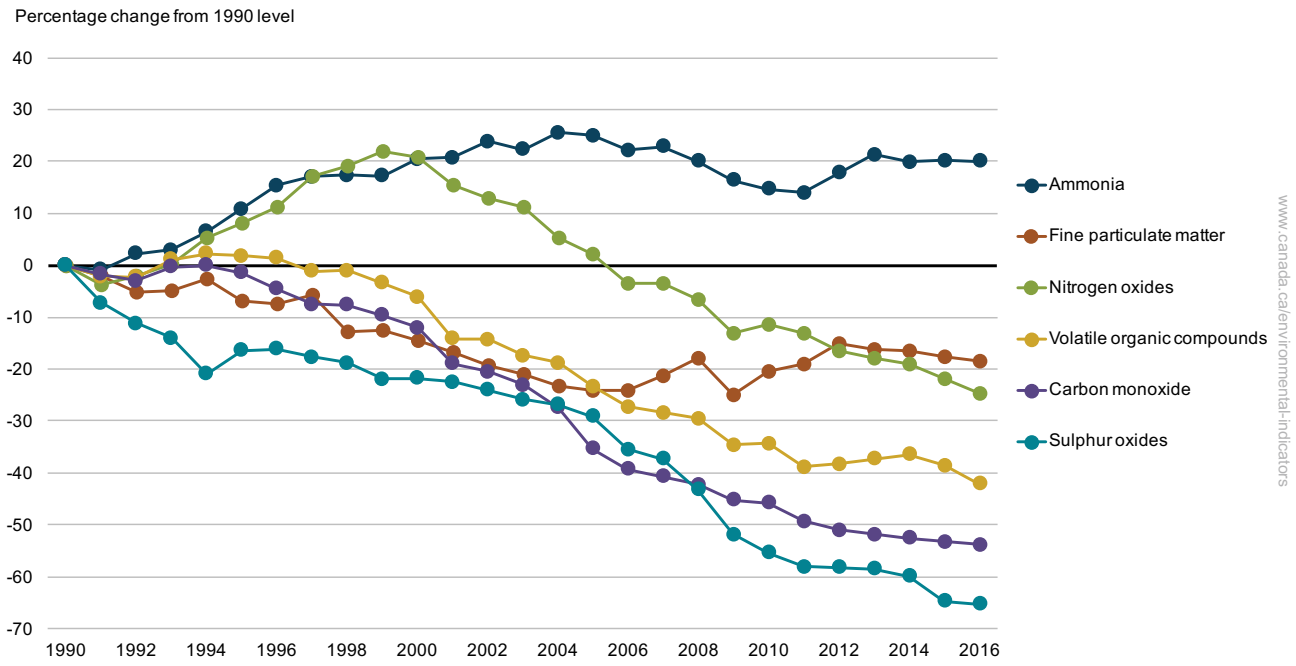
AIR POLLUTANT EMISSIONS

Air pollution can affect Canadians' health, the environment, buildings, structures and the economy in general. Air pollution problems such as smog and acid rain result from the presence of, and interactions among, various air pollutants released to the atmosphere through natural processes and human activities. Human sources of air pollution include activities that rely on carbon-based fuels (for example, transportation, electric utilities), industrial processes such as oil and gas industry, as well as certain products, such as paints and solvents.

In 2016, emissions of 5 key air pollutants (sulphur oxides [SO_x], nitrogen oxides [NO_x], volatile organic compounds [VOCs], carbon monoxide [CO] and fine particulate matter [$PM_{2.5}$]) were 65% to 18% lower than in 1990. Emission levels of ammonia (NH_3) were 20% higher than in 1990. These reductions since 1990 are due in part to government actions and voluntary initiatives from key industrial emitters that were put in place to restrict or eliminate the release of air pollutants in Canada.

The growth in NH_3 emissions between 1990 and 2016 was driven by the agriculture sector (livestock, crop production and fertilizer). The growth is mainly due to the increased use of synthetic nitrogen fertilizers and, up to 2005, larger livestock populations.

FIGURE B.36 EMISSION LEVELS OF KEY AIR POLLUTANTS, 1990 TO 2016



Note: The indicator reports air pollutant emissions from human activities only.

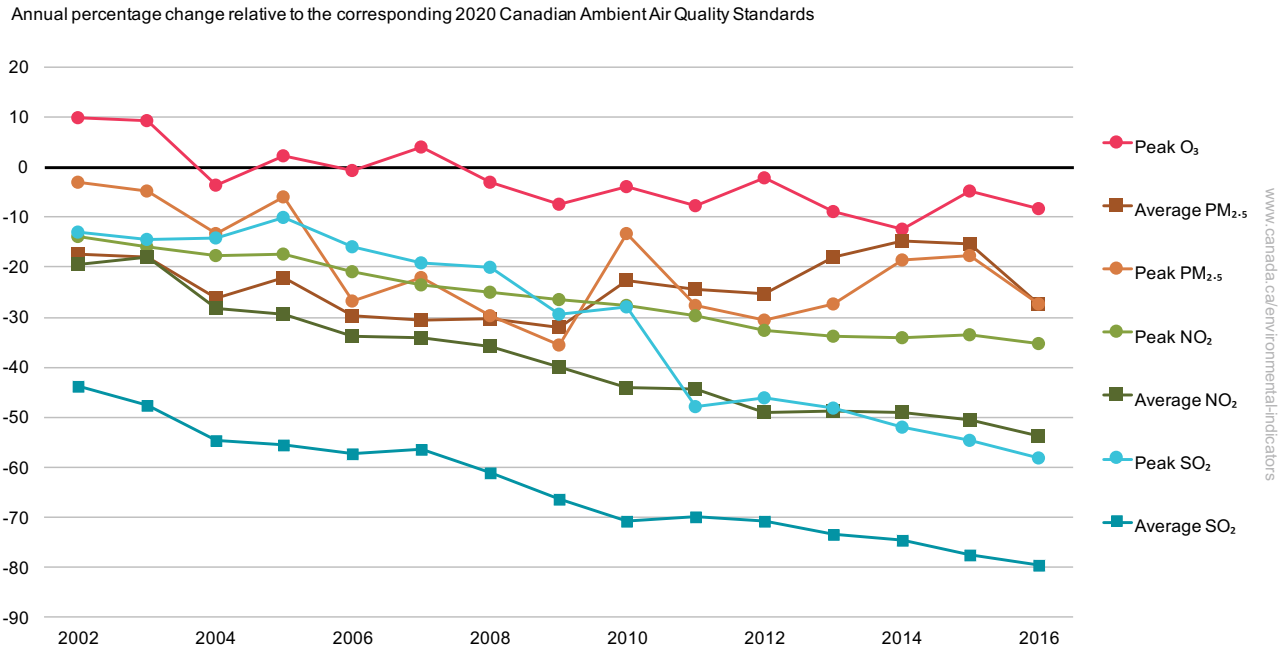
Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Air pollutant emissions. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/air-pollutant-emissions.html.

AIR QUALITY

Air quality problems such as smog and acid rain result from the release of pollutants into the atmosphere. The majority of these pollutants come from human activities, such as transportation, the burning of fuels for electricity and heating, and industry. Air pollutants also cause adverse health and environmental effects.

The concentration of air pollutants in the air have generally declined since 2002. Only fine particulate matter and the peak ozone show no strong trend, neither a decline nor an increase. Since 2008, all main pollutants that we measure against their associated Canadian Ambient Air Quality Standard (the Standards) - fine particulate matter ($PM_{2.5}$), sulphur dioxide (SO_2), nitrogen dioxide (NO_2) and peak ozone (O_3) – have been below their associated 2020 Standards.

FIGURE B.37 AIR QUALITY INDICATORS RELATIVE TO THE CANADIAN AMBIENT AIR QUALITY STANDARDS, 2002 TO 2016



Note: The horizontal line at 0% represents the reference level of the 2020 Canadian Ambient Air Quality Standards. The Canadian Ambient Air Quality Standards are shown for indicative purposes only.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Air pollutant emissions. Available at www.canada.ca/en/environment-climate-change/services/environmental-indicators/air-quality.html.

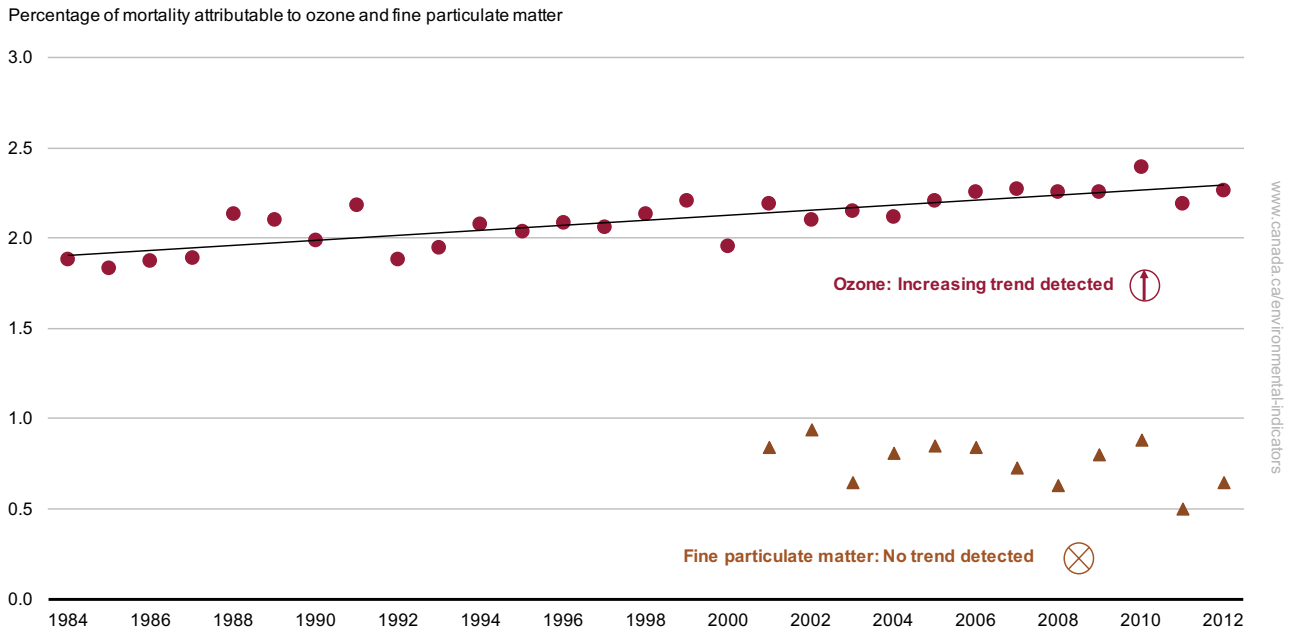
AIR HEALTH TREND INDICATORS

Canadians are exposed to air pollutants on a daily basis, and this exposure can cause adverse health effects. Fine particulate matter ($PM_{2.5}$) and ozone (O_3), two of the most widespread air pollutants, are key components in the formation of smog. Exposure to these pollutants, even at low concentrations, has been associated with pulmonary and cardiovascular diseases. Exposure to air pollution can lead to chronic lung disease, heart attacks, strokes and other health effects.

Although substantial efforts have been made to improve air quality in Canada over the last few decades, the indicator suggests that outdoor air pollution continues to be an important public health issue in Canada.

- On average, for those years for which estimates can be made, approximately 2% of deaths, excluding deaths from injuries, can be attributed to ground-level ozone exposure, and 0.8% to fine particulate matter exposure.
- The proportion of deaths that can be attributed to ground-level ozone shows an increasing trend.

FIGURE B.38 MORTALITY ATTRIBUTABLE TO FINE PARTICULATE MATTER (2001 TO 2012) AND GROUND-LEVEL OZONE (2001 TO 2012), CANADA



Note: The current indicator relates mortality to the air pollution concentrations on the same day only and do not include the health impacts of long-term exposure to these air pollutants The mortality risk refers to the percentage of mortalities (excluding deaths from injuries) attributable to ground-level ozone and fine particulate matter.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Air health trend indicator. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/air-health-ozone-fine-particulate-matter.html.

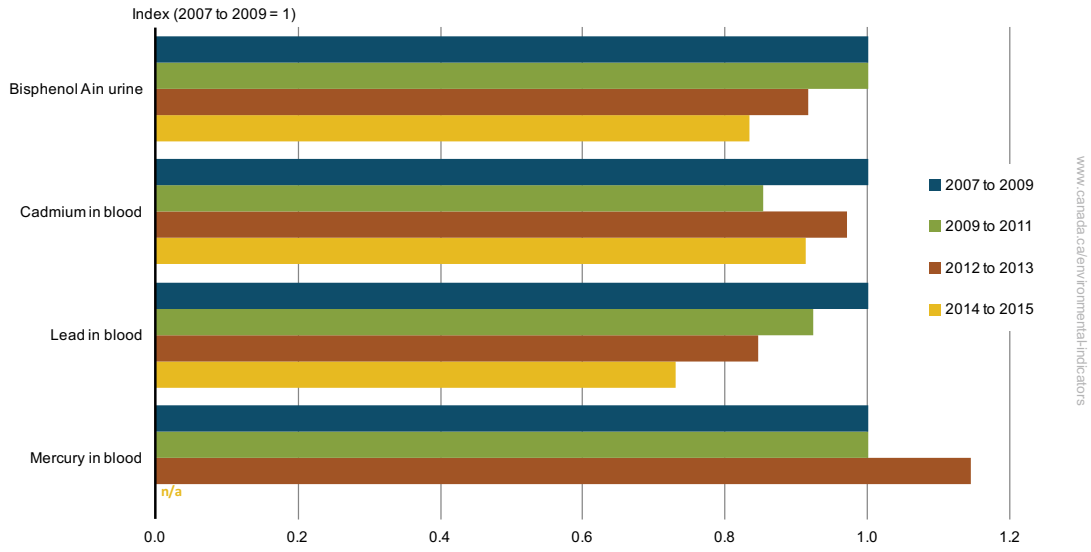
HUMAN EXPOSURE TO HARMFUL SUBSTANCES

Chemical substances are everywhere, including the air, soil, water, products and food, and can enter the body through ingestion, inhalation and skin contact. The Government of Canada uses a variety of methods, tools and models to assess human exposure to environmental chemicals and their potential health effects. The Canadian Health Measures Survey measures environmental chemicals and their metabolites in blood and urine of participants. These indicators provide a snapshot of the survey results. Through biomonitoring, the government can identify priorities, develop or revise risk management strategies, and track progress on policies put in place to reduce or control these substances.

Four surveys conducted from 2007 to 2015 indicate the following.

- Provisional results indicate a marginal decreasing trend in the average concentration of BPA in urine between the periods 2007 to 2009 and 2014 to 2015.
- There is no significant trend in the average concentration of cadmium in blood in Canadians between the periods 2007 to 2009 and 2014 to 2015.
- There is a significant decreasing trend in average concentration of blood lead in Canadians with a 26% decrease between the periods 2007 to 2009 and 2014 to 2015, and an 80% decrease since 1978 to 1979. This is mainly attributed to the progressive phase-out of lead in gasoline, paint and food cans solder.
- There is no significant trend in the average concentrations of blood mercury in Canadians between the periods 2007 to 2009 and 2014 to 2015.

FIGURE B.39 CHANGES IN THE AVERAGE CONCENTRATION OF SELECTED SUBSTANCES IN BLOOD OR URINE IN CANADIANS, BETWEEN THE PERIODS 2007 TO 2009 AND 2014 TO 2015



Note: The chart presents changes in the average (geometric mean) concentrations of selected substances in Canadians relative to the values in the period 2007 to 2009. The concentrations of mercury, lead and cadmium in blood and bisphenol A in urine are from participants aged 3 to 79 years, except for the period 2007 to 2009 when there were no participants under the age of 6 years. n/a = not available, since more than 40% of samples were below the limit of detection.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Human exposure to harmful substances. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/human-exposure-harmful-substances.html.

POLYBROMINATED DIPHENYL ETHERS IN FISH AND SEDIMENT

Polybrominated diphenyl ethers (PBDEs) are toxic substances that remain in the environment for long periods after their release. They build up in living organisms such as fish, seals and birds and have a harmful effect on species health and biodiversity.

Across Canada, concentrations of some PBDEs were consistently below guidelines while other PDBEs were often above guidelines. From 2013 to 2015, fish sampling was conducted in 10 drainage regions in Canada. Concentrations for 4 subgroups of PBDE were analyzed.

- TriBDE and hexaBDE concentrations were below the guidelines in all samples.
- TetraBDE concentrations were below the guidelines for all but 1 sampled drainage region.
- PentaBDE concentrations were above the guidelines for 8 of the 10 sampled drainage regions.

The results of the 2013 to 2015 sampling campaign indicate deterioration in comparison to the 2011 to 2012 sampling campaign in two cases. The 2013 to 2015 campaign found fish samples exceeding tetraBDE in Great Lakes and pentaBDE in Lower Saskatchewan–Nelson. In the case of the Lower Saskatchewan–Nelson region, however, the change is very small and likely due to natural variability in contaminant burden.

TABLE B.5 PBDE SUBGROUP CONCENTRATIONS IN FISH RELATIVE TO GUIDELINES BY DRAINAGE REGIONS, 2013 TO 2015

Sampled drainage regions	triBDE	tetraBDE	pentaBDE	hexaBDE
Columbia	✓	✓	×	✓
Yukon	✓	✓	×	✓
Peace–Athabasca	✓	✓	×	✓
Lower–Mackenzie	✓	✓	✓	✓
Assiniboine–Red	✓	✓	×	✓
Lower–Saskatchewan-Nelson	✓	✓	× [A]	✓
Churchill	✓	✓	×	✓
Great Lakes	✓	× [A]	×	✓
St. Lawrence	✓	✓	×	✓
Maritime Coastal	✓	✓	✓	✓

× Exceeded guidelines ✓ Below guidelines

Note: [A] Represents a change between the results from the 2011 to 2012 sampling campaign and the 2013 to 2015 sampling campaign. For the 2013 to 2015 period, samples were collected from the catch of 411 representative predatory fish (Lake Trout, Walleye, Cutthroat Trout, Rainbow Trout or Brook Trout) collected in 10 drainage regions. For the 2011 to 2012 period, measurements were made in 247 fish. A green check-mark (✓) means no sample collected in the drainage region returned a concentration reading above the guideline. A red X-mark (×) means at least 1 sample collected in the drainage region returned a concentration reading above the guideline.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Polybrominated diphenyl ethers in fish and sediment. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/polybrominated-diphenyl-ethers-fish-sediment.html.

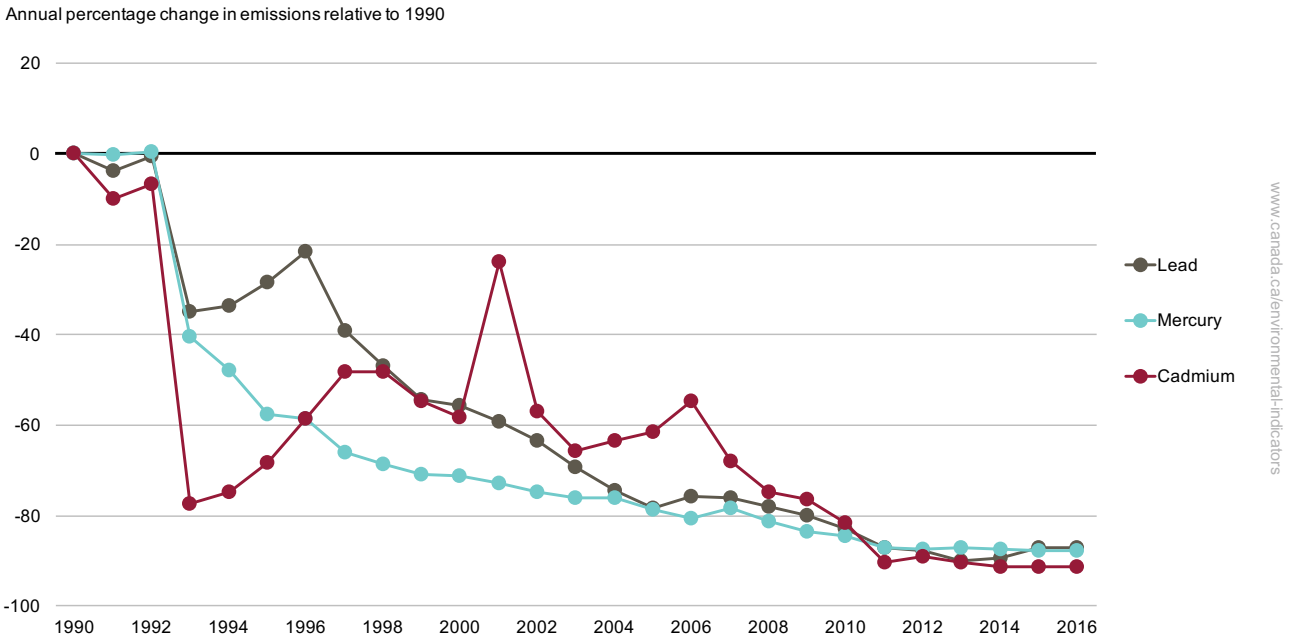
EMISSIONS OF HARMFUL SUBSTANCES TO AIR

Emissions of some substances can harm human health, wildlife and biological diversity. For example, small particles of toxic metals can travel long distances in the air and be inhaled or settle on the ground and in water. There, they can enter the food web and build up in the tissues of living organisms. Exposure to these substances, even in small amounts, can be hazardous to both humans and wildlife.

Lead, mercury and cadmium emissions to air decreased by 87%, 88% and 91%, respectively, between 1990 and 2016. Emissions have plateaued in recent years, partly due to previous implementation of regulations and adoption of emission reducing technologies.

The decline in lead emissions resulted from implementing pollution prevention regulations that limited or eliminated lead in some materials (such as gasoline and paints) and implementing measures in smelters, along with closing outdated smelters. However, a small increase is observed in the recent years, partly due to an increased production in the smelting and refining industry. Reductions in emissions from mining and rock quarrying from 1990 to 1998, as well as slight emission reductions in air transportation across the whole period, also influenced the overall decline in lead emissions since 1990. Mercury emissions reductions are mostly attributed to the actions of a single large facility over this period. This included changing its zinc production method, improving its controls of fine particulate matter emissions and switching to cleaner fuels.

FIGURE B.40 MERCURY, LEAD AND CADMIUM EMISSIONS TO AIR, CANADA, 1990 TO 2016



Note: The indicator reports emissions from human activities only.

Source: Environment and Climate Change Canada (2018) Canadian Environmental Sustainability Indicators: Emission of harmful substances to air. Consulted on August 31, 2018. Available at: www.canada.ca/en/environment-climate-change/services/environmental-indicators/emissions-harmful-substances-air.html.

ADDITIONAL INFORMATION ON SAFE AND HEALTHY COMMUNITIES

Canadian Environmental Sustainability Indicators

- Air pollutant emissions
- Air quality
- Air health indicator
- Emissions of harmful substances to air
- Levels of human exposure to harmful substances
- Polybrominated diphenyl ethers (PBDEs) in fish and sediment
- Perfluorooctane sulfonate (PFOS) in fish and water
- Releases of harmful substances to water

ANNEX C: LIST OF DEPARTMENTS AND AGENCIES

The following departments and agencies are required to table sustainable development strategies under the *Federal Sustainable Development Act*:

1. Agriculture and Agri-Food Canada
2. Atlantic Canada Opportunities Agency
3. Canada Border Services Agency
4. Canada Economic Development for Quebec Regions
5. Canada Revenue Agency
6. Canadian Heritage
7. Department of Finance Canada
8. Department of Justice Canada
9. Employment and Social Development Canada
10. Environment and Climate Change Canada
11. Fisheries and Oceans Canada
12. Global Affairs Canada
13. Health Canada
14. Immigration, Refugees and Citizenship Canada
15. Indigenous and North Affairs Canada (Indigenous Services Canada / Crown-Indigenous Relations and North Affairs Canada)
16. Innovation, Science and Economic Development Canada
17. National Defence
18. Natural Resources Canada
19. Parks Canada
20. Public Health Agency of Canada
21. Public Safety Canada
22. Public Services and Procurement Canada
23. Transport Canada
24. Treasury Board of Canada Secretariat
25. Veterans Affairs Canada
26. Western Economic Diversification Canada

While not bound by the Act, the following organizations are contributing to the 2016 to 2019 Federal Sustainable Development Strategy:

1. Canadian Coast Guard
2. Canadian Environmental Assessment Agency
3. Canadian Food Inspection Agency
4. Canadian Northern Economic Development Agency
5. Correctional Services Canada
6. Federal Economic Development Agency for Southern Ontario
7. Federal Economic Development Initiative for Northern Ontario
8. Infrastructure Canada
9. Jacques Cartier and Champlain Bridges Incorporated
10. National Capital Commission
11. National Research Council of Canada
12. Royal Canadian Mounted Police
13. Standards Council of Canada
14. Statistics Canada
15. Sustainable Development Technology Canada

ANNEX D: ACTIONS SUPPORTING THE FEDERAL SUSTAINABLE DEVELOPMENT STRATEGY

Twenty-six (26) departments and agencies under the Federal Sustainable Development Act, as well as 15 voluntary federal organizations, contribute to implementing the Federal Sustainable Development Strategy (FSDS). This annex provides a representative selection from the more than 700 actions departments have committed to undertaking in their sustainable development strategies. For a complete list of departmental actions, please consult the FSDS Fall 2017 update.

EFFECTIVE ACTION ON CLIMATE CHANGE

A low-carbon economy contributes to limiting global average temperature rise to well below two degrees Celsius and supports efforts to limit the increase to 1.5 degrees Celsius.

Environment and Climate Change Canada
Lead Canada's participation in the United Nations Framework Convention on Climate Change with the aim of negotiating ways to implement the Paris Agreement.
Conduct or review upstream GHG assessments for all major energy projects undergoing review.
Develop and implement regulations to limit GHG emissions and once they are in place, promote compliance and carry out enforcement activities, including in the electricity, energy efficiency, and transportation and shipping sectors.
Fisheries and Oceans Canada
Conduct two annual 28-day ocean water sampling projects from Canadian Coast Guard vessels, which are used for climate change research and other research areas.
Finance Canada
Continue to impose a Green Levy on certain fuel-inefficient passenger vehicles sold in Canada.
Indigenous Services Canada/ Crown-Indigenous Relations and Northern Affairs
Provide direct funding through the Indigenous Community-Based Climate Monitoring Program to support Indigenous communities to collect climate data at the community level and facilitate the integration of the information into regional and national monitoring initiatives.

Natural Resources Canada
Set more than 35 minimum energy performance standards for appliances and equipment by 2020 under the Energy Efficiency Regulations.
Improve the energy efficiency of Canadian homes through the EnerGuide, ENERGY STAR® and R-2000 home labelling initiatives, and the industrial sector using energy management systems such as ISO 50001, the Superior Energy Performance program, and the ENERGY STAR® or other industry programs to help businesses track, analyze, and improve their energy efficiency.
Collaborate with the United States and Mexico on a common benchmarking platform for the freight sector (the SmartWay Freight Partnership).
Maintain and increase carbon stored in forested lands, wetlands and agricultural lands by providing tools and information to decision makers through research, national assessments and monitoring to develop scientific information on Canada's forest ecosystems, to support knowledge-based sustainable forest management policies and practices, such as with Carbon Budget Model and Ecosystem Management Emulating Natural Disturbance tools, which are validated annually.
Transport Canada
Address GHG emissions from the rail sector through the joint Canada–US locomotive emissions initiative under the Regulatory Cooperation Council, a voluntary agreement with the Canadian rail industry, and research activities to enhance understanding of new technologies to reduce GHG emissions.
Under the Truck Reservation System Program, address GHG emissions by supporting the deployment of technology projects at port and terminal facilities to improve efficiency in the movement of trucks into and out of terminal facilities at container ports and reduce truck idling.
Provide funding to support northerners in adapting their transportation systems to climate change through research, development and capacity building.

LOW-CARBON GOVERNMENT

The Government of Canada leads by example by making its operations low-carbon

Agriculture and Agri-Food Canada
Procure 35% green electricity from renewable energy sources in Alberta.
Continue the requirement that 100% of all new contracts that include janitorial services will include the use of janitorial products that minimize the environmental impact.
Fisheries and Oceans Canada
Replace old Marine Communications and Traffic Services and Aids to Navigation power generation equipment, with cleaner, low-carbon energy solutions.
Install solar panels or a solar wall at Search and Rescue Stations to reduce energy consumption and operating costs.
Install solar panels at the following Canadian Coast Guard (CCG) bases: Nanaimo CCG Base (British Columbia); Hay River CCG Base (Northwest Territories); Prescott CCG Base (Ontario); Parry Sound CCG Base (Ontario); Richmond CCG Base (British Columbia); Sidney CCG Base (British Columbia).

Immigration, Refugees and Citizenship Canada
Promote behaviour change in fleet use (for example, anti-idling messaging and fleet manager and driver training).
Justice Canada
Average energy consumption of Justice computer devices has remained stable despite increased leveraging of digital resources over the past fiscal year.
Increase in the digital share of the JUS legal research collection from 31% to 42% in FY2017-18.
Move towards digital corporate recording -336 GB held on internal document management platform, 176 GB held in GCDOCS, and 4450 GB held in legal case management system.
Significant progress towards culture change and employee training in the use of the internal document management platform with 2150 employees now trained since 2015.
National Defence
Invest $225 million by 2020 in a wide range of infrastructure projects across Canada to reduce National Defence's carbon footprint.
Ensure 30% of National Defence light-duty vehicle fleet runs on hybrid, plug-in hybrid and/or electric technology, where suitable for operational needs and where vehicles with this technology are available in the Government Motor Vehicle Ordering Guide, by March 31, 2020.
Natural Resources Canada
Support the Treasury Board Secretariat Centre for Greening Government by providing "a one-stop shop" for advice and technical support to other federal departments. This support will help federal organizations design and implement energy saving and GHG reduction projects in their facilities and deploy low-emission vehicles and charging stations. This work will also support the Centre for Greening Government in developing a centralized GHG inventory tool for reporting, monitoring and public disclosure of federal GHG emissions.
Treasury Board of Canada Secretariat
Offer offsetting options to reduce the impact of government travel.
Work with Environment and Climate Change Canada and other departments to understand and address the wide range of climate change impacts on federal assets and operations.
Develop additional guidance to strengthen integration of low-carbon climate resilience and green considerations in investment planning.
Western Economic Diversification Canada
Encourage staff to reserve accommodation in establishments that have an industry-recognized environmental rating.
Transport Canada
Implement the Transportation Assets Risk Assessments initiative to better understand climate change risks to federally-owned transportation infrastructure and potential adaptation solutions that could be employed.

CLEAN GROWTH

A growing clean technology industry in Canada contributes to clean growth and the transition to a low-carbon economy

Innovation, Science and Economic Development Canada
The Clean Growth Hub: a single window service to streamline client services, improve federal program coordination, enable tracking and reporting on clean tech results across government, and connect stakeholders to international markets.
Innovative Solutions Canada: a new procurement program for early stage research and development, late-stage prototypes from Canadian innovators and entrepreneurs.
Innovation Superclusters Initiative: resources to support five business-led innovation "superclusters" that have the greatest potential to accelerate economic growth.
Strategic Innovation Fund: open to all sectors, including clean technology, this fund supports company-led research and development and commercialization projects, firm expansion and growth, investment attraction and collaborative technology demonstration projects.
Natural Resources Canada
Support the development of technologies to reduce energy consumption in mining and milling and eliminate diesel, replacing it with alternative energy sources in underground mines under the Green Mining Initiative.
Provide financial contributions to FPInnovations, other forest sector research partners and eligible forest product companies for research, development and demonstration of new products, processes and technologies focused on clean energy such as biofuels.

MODERN AND RESILIENT INFRASTRUCTURE

Modern, sustainable, and resilient infrastructure supports clean economic growth and social inclusion

Indigenous Services Canada / Crown-Indigenous Relations and Northern Affairs
Work with First Nations to develop solid waste management approaches that meet individual community needs.
Infrastructure Canada
Provide funding for large-scale infrastructure projects supporting mitigation of natural disasters and extreme weather events and strengthened climate resilience.
Support municipalities as they prepare for and adapt to climate change, and as they reduce GHG emissions.
Natural Resources Canada
Enhance the Energy Code for Buildings by 2020 and move towards net-zero-energy-ready buildings.
Demonstrate innovative clean energy solutions for northern communities and reduce their reliance on diesel power.
Facilitate the development and deployment of next-generation electric vehicle charging infrastructure.

CLEAN ENERGY

All Canadians have access to affordable, reliable and sustainable energy

Natural Resources Canada
Support Finance Canada and Environment and Climate Change Canada in identifying and phasing out inefficient fossil fuel subsidies by 2025.
Add a certification component for high-performing commercial and institutional buildings to the ENERGY STAR® Portfolio Manager benchmarking tools to allow building owners to compare their energy use and prompt them to make improvements.
Launch the ENERGY STAR® for Industry program in Canada and offer plant certification to two or three industry sectors to recognize high performers.
Accelerate the adoption of ISO 50001, an innovative energy management system in the industrial sector.
Provide a new suite of tools to support consumers' vehicle purchasing decisions and encourage fuel-efficient driving behaviours.
Advance Canada's clean energy and climate mitigation goals through bilateral partnerships and under the United Nations Framework Convention on Climate Change, the North American Clean Energy and Environment Agreement, Mission Innovation, the International Energy Agency, and the Clean Energy Ministerial process, as well as the G7 and G20, among others.

HEALTHY COASTS AND OCEANS

Coasts and oceans support healthy, resilient and productive ecosystems

Fisheries and Oceans Canada/Canadian Coast Guard
Oceans Protection Plan: • Establish Coastal Habitat Restoration Fund to support community-based efforts to restore degraded habitats. • Install eight new radars across the country to increase the Coast Guard's capability to monitor and manage marine traffic.
Natural Resources Canada
Generate maps of the seafloor to provide increased knowledge of natural hazards that could affect port facilities, tanker safety and oil spill prevention on the British Columbia coast.
Transport Canada
Contribute to reducing pollution from vessels by monitoring compliance of marine transportation firms with Canadian legislation, such as the Canada Shipping Act, 2001, through the National Aerial Surveillance Program, inspections, audits, monitoring and enforcement.

Transport Canada/Fisheries and Oceans Canada/Canadian Coast Guard
Oceans Protection Plan: • Work with Indigenous and coastal communities to design new information-sharing systems and platforms so they have access to real-time information on marine shipping activities to support safer navigation in local waters. • Work closely with Indigenous and coastal communities, the Government of Canada will create a pilot baseline program to better understand the cumulative effects of shipping on coastal ecosystems. • Implement a real-time whale detection system to protect aquatic ecosystems by alerting mariners to the presence of whales, which will help them avoid interactions and vessel strikes. • Implement a national strategy that focuses on the prevention and removal of abandoned and wrecked vessels.

PRISTINE LAKES AND RIVERS

Clean and healthy lakes and rivers support economic prosperity and the well-being of Canadians

Environment and Climate Change Canada
Collaborate with partners to conserve and enhance the St. Lawrence ecosystem and to maintain and recover its uses through the Canada-Quebec Agreement 2011 to 2026.
Through the application-based Eco-Action program, the Department will match 50% funding support to not-for-profit and non-government organizations to undertake local projects that address departmental priorities (clean growth and climate change, nature, clean air and water).
Apply payments received by the Environmental Damages Fund to address environmental damage and to undertake research that increases the Government of Canada's ability to restore damaged environments.
Natural Resources Canada
Using landscape-level considerations, assess influences of forest management and other disturbances on forest and aquatic biodiversity and ecosystem services with academic, provincial and industry partners.
Map the regional aquifer system of Southern Ontario to assess the contribution of groundwater resources to the Great Lakes system and thus support water resources management.
Conduct research to better understand the risk potential (in other words, a substance moving through a system after previously being settled) of metals in lake and river ecosystems in a changing climate.
Transport Canada
Update the regulatory framework for protecting the marine environment from the introduction and spread of aquatic invasive species by ships, including the relevant provisions of Annex V of the Great Lakes Water Quality Agreement.

SUSTAINABLY MANAGED LANDS AND FORESTS

Lands and forests support biodiversity and provide a variety of ecosystem services for generations to come

Atlantic Canada Opportunities Agency
In 2017–18, support intervention measures to prevent the spread of spruce budworm in the forests of the Atlantic Provinces.
Canada Border Services Agency
Work on behalf of the Canadian Food Inspection Agency to intercept live, forest-insect pests in wood packaging and to verify compliance at the border with the Canadian Food Inspection Agency's plant and animal health legislation and regulations with respect to wood packaging material and soil.
Canada Economic Development for Quebec Regions
Deliver the spruce budworm control initiative in Quebec forests with a view to reducing the negative impact of this pest on the environment and creating economic development opportunities in the various regions.
Canadian Food Inspection Agency
Continue work with the United States on implementing and assessing a joint pre-departure certification program for Asian gypsy moth in countries that are regulated for this pest. This includes multilateral outreach activities and compliance verification of vessels calling on in North America.
Finance Canada
Maintain the incentives for the protection of Canada's ecologically sensitive land, including habitat used by species at risk, through ongoing tax assistance for donations of ecologically sensitive land under the Ecological Gifts Program, and the continued protection of land which has been donated.
Environment and Climate Change Canada
Develop an inventory of conserved lands to support a multi-species approach to conservation and to deliver on the Fully Accounting for Canada's Conservation Lands initiative.
Maintain and improve the integrated Canadian Wildlife Service Geospatial Knowledge Management Initiative database, to ensure availability of geo-referenced information for conservation planning and implementation.
Develop management plans for the National Wildlife Areas and Migratory Bird Sanctuaries in Nunavut as part of the renewed 7-year Inuit Impact and Benefit Agreement, signed in April 2016.
Support on-the-ground wetland restoration and enhancement projects in Canada through the National Wetland Conservation Fund.
Maintain strong collaborative partnerships with international, federal, provincial, Indigenous and non-governmental organizations and individuals through the Habitat Stewardship Program to protect, improve and/or restore habitat to enhance the survival of migratory birds and species at risk.

Natural Resources Canada
Refinance the Carbon Budget Model and use it to produce annual estimates of forest-related GHG emissions and removals in Canada.
Provide forest managers with indicators and ready-to-use science-based adaptation toolkits.
Develop science-based solutions and tools to better detect, slow the spread and reduce impact of invasive alien species, including working in partnership with the Canadian Food Inspection Agency to create wood packaging standards and control measures to manage known and unknown alien species.
Through engagement with provinces and territories, industry and international partners, develop and deliver science-based solutions to help reduce wildland fires for forest-based communities. Sharing international wildland fire management resources will advance fire response by fire management agencies and first responders. Opportunities for knowledge sharing include the Canadian Interagency Forest Fire Centre, and the Canadian Council of Forest Minister's Canadian Wildland Fire Strategy.
Provide Indigenous communities and organizations with financial and technical support to increase their participation in Canada's forest sector.
Work collaboratively with provinces and territories, federal agencies (for example, Canadian Food Inspection Agency and Public Safety Canada) and Indigenous communities to implement and advance wildland fire and forest pest strategies.
Parks Canada
Advance work on the feasibility assessment for a proposed national park in the Interlake region of the Manitoba Lowlands natural region of the national park system.
Continue to monitor the ecological integrity of park ecosystems, to restore impaired ecosystems and to recover species at risk on a priority basis through the national Conservation and Restoration program and other park-based initiatives. Thirteen major projects, from Terra Nova in Newfoundland to Gwaii Haanas in British Columbia, are oriented towards land and forest restoration by 2019 with 3 more projects to begin in 2017.

HEALTHY WILDLIFE POPULATIONS

All species have healthy and viable populations

Canada Border Services Agency
Work with Fisheries and Oceans Canada and Canadian provinces to prevent aquatic invasive species, such as Asian carp and zebra mussels, from entering Canada, and with Environment and Climate Change Canada to prevent the introduction into Canada of invasive terrestrial animals and wild animal diseases.

Environment and Climate Change Canada
Work with partners to finalize a Species at Risk Act Management Plan for the polar bear. In addition, work with international partners to implement a Circumpolar Action Plan for polar bear in accordance with the 1973 Agreement on the Conservation of Polar Bears.
Collaborate with stakeholders and Indigenous partners at home via various Species at Risk Act-mandated and Species at Risk Act-enabled advisory bodies including but not limited to the Species at Risk Advisory Committee, the National Aboriginal Council on Species at Risk and the First Nation Advisory Committee on Species at Risk to protect species and their habitats.
Provide funding through the Aboriginal Fund for Species at Risk to support Indigenous capacity to participate actively in the recovery of endangered, threatened and other species at risk, and to prevent other species from becoming a conservation concern.
Undertake international actions for the conservation of migratory birds (under the auspices of the Commission for Environmental Cooperation), and deliver projects for seabird conservation in Chile (under the Canada-Chile Agreement on Environmental Cooperation) and for shorebird monitoring in Panama (under the Canada-Panama Environment Agreement).
Coordinate Canada's participation with the US and Mexico in the Trilateral Committee for Wildlife and Ecosystem Conservation and Management, and support trilateral working group to ensure the conservation of the Monarch butterfly migration, as per the 2016 North American Leaders Summit commitment.
Fisheries and Oceans Canada/Canadian Coast Guard
Provide science advice and information in support of species assessment, listing and recovery planning under the Species at Risk Act.
Parks Canada
Complete action plans for the remaining national parks with three or more species at risk (Pacific Rim National Park Reserve, Kejimkujik National Park and National Historic Site, Pukaswa National Park Reserve and Banff, Jasper, Yoho, Kootenay and Waterton Lakes national parks).

CLEAN DRINKING WATER

All Canadians have access to safe drinking water and, in particular, the significant challenges Indigenous communities face are addressed

Health Canada
Support all First Nations communities in ensuring they have ongoing access to a trained Community Based Drinking Water Quality Monitor or an Environmental Health Officer to sample and test the drinking water for potential bacteriological contamination.
Develop/update health-based drinking water quality guidelines and guidance documents in collaboration with federal, provincial and territorial partners, intended for use by all jurisdictions in Canada as the basis for their drinking water requirements to help ensure the safety of drinking water in Canada.
Indigenous Services Canada / Crown-Indigenous Relations and Northern Affairs
Provide funding and advice to First Nation communities on the planning, procurement, design, construction, commissioning, operation and maintenance of water and wastewater systems.
Public Health Agency of Canada
Implement Potable Water on Board Trains, Vessels, Aircraft and Buses Regulations (Potable Water Regulations) including conducting inspections and assessments on international and interprovincial airplanes, trains, cruise ships, ferries and buses to protect the health and safety of the travelling public, ensuring that critical violations are mitigated in a timely manner.

SUSTAINABLE FOOD

Innovation and ingenuity contribute to a world-leading agricultural sector and food economy for the benefit of all Canadians

Agriculture and Agri-Food Canada
Conduct research to increase knowledge of agriculture's impact on water resources and enhance knowledge of nutrient management to increase efficiency and lower the potential of contamination of water resources.
Conduct basic and applied research to increase knowledge of the effects of agricultural production on air.
Build the capacity of Canada's agriculture, agri-food and agri-based products sector to promote innovation and encourage adoption of sustainable agricultural practices at farm and regional levels by working with provinces and territories. For example, work to increase the number of beneficial management practices implemented to 17,600 by March 31, 2019, through cost-shared programming under the Growing Forward 2 framework (2013 to 2018).
Canadian Food Inspection Agency
Develop and implement regulatory programs and controls for new invasive plants, plant pests, and pathways to prevent their introduction and spread in Canada.
Track the incidence of morbidity or mortality in commercial, recreational and Aboriginal fish species from pesticide treatments at salmon farms, as per the Aquaculture Activities Regulations.
Conduct targeted regulatory research on fish pest and pathogen interactions, ecosystem management and interactions with wild populations.
Health Canada
Expand the nutrition education component of the Nutrition North Canada Program to include the new communities that were added in 2016–17.
Indigenous Services Canada / Crown-Indigenous Relations and Northern Affairs
Provide a retail based subsidy on nutritious, perishable food that must be transported by air to northern communities without year-round surface access.
Public Services and Procurement Canada
Support and facilitate the principles of organic agriculture. The principal goal of organic production is to develop operations that are sustainable and harmonious with the environment.
Support and facilitate the principles of organic aquaculture. The principal goal of organic aquaculture is to protect the environment, maintain long-term biological stability and recycle materials and resources.
Sustainable Development Technology Canada
Support the development of technologies through the SD Tech Fund that enable the efficient use of water and other materials such as fertilizer in the agricultural sector.

CONNECTING CANADIANS WITH NATURE

Canadians are informed about the value of nature, experiencing nature first hand, and actively engaged in its stewardship

Environment and Climate Change Canada
Work with the Nature Conservancy of Canada to deliver Government priorities, including accelerating the rate of private land conservation and protecting important natural habitat in communities across southern Canada.
Implement the Connecting Canadians to Nature Initiative in ten national wildlife areas by constructing new trails, bridges and exhibits, and promoting a national geocaching program (an outdoor educational game that uses GPS-enabled devices).
Parks Canada
Launch an improved website and a new mobile app designed to help new visitors learn about Canada's natural and cultural heritage and plan their visit.
Continue to engage youth through programs, such as The Duke and Duchess of Cambridge Youth Ambassador program, Canada's Coolest School Trip Contest and the post-secondary Campus Club network, Students on Ice program and partnerships with youth organizations.
Continue the partnership with the Institute for Canadian Citizenship, whereby new Canadian citizens are offered complimentary admission to Parks Canada's destinations for one year through the Institute's Cultural Access Pass.

SAFE AND HEALTHY COMMUNITIES

All Canadians live in clean, sustainable communities that contribute to their health and well-being

Environment and Climate Change Canada
Provide expert advice to help federal custodians assess and remediate their contaminated sites to ensure that the highest-priority sites are remediated under Federal Contaminated Sites Action Plan and to reduce the ecological risks they pose.
Better understand harmful substances by conducting scientific assessment to determine the risks to the environment from substances that are already in commerce (existing substances) and substances proposed for use in Canada (new substances). The assessment provides the evidence needed to determine whether a substance is toxic, and ultimately, whether risk management is required.
Implement the Air Quality Health Index to provide Canadians with greater access to local air quality information and forecasts to help make informed decision about their health.
Contribute to the Canadian Environmental Sustainability Indicators, which track Canada's performance on key sustainability issues related to air pollutant emissions and air quality and ensure that national, regional, local and international data are publicly accessible and transparent.
Develop and/or finalize and implement industrial emissions requirements for various equipment types and sectors, using regulatory and non-regulatory instruments such as the Multi-Sector Air Pollutants Regulations, nitrogen oxides guidelines for new stationary combustion turbines and performance agreements for the aluminum and the iron ore pellets sectors.
Implement measures to reduce black carbon emissions from wood-burning appliances and new stationary diesel engines.

Health Canada
Raise awareness of the health impacts of indoor air pollution and support improvements to indoor air quality through research, assessment of health risks, and the development of indoor air quality guidelines.
Collaborate with other federal partners and provincial authorities to strengthen nuclear emergency preparedness and response.
Provide information to inform action and decision making related to indoor radon exposure.
Indigenous Services Canada/ Crown-Indigenous Relations and Northern Affairs
Continue research and monitoring related to contaminant levels and their effects in wildlife and people in the Canadian North as part of the Northern Contaminants Program efforts to reduce and, wherever possible, eliminate contaminants in traditionally harvested foods, while providing information that assists individuals and communities make informed decisions about their food use.
Natural Resources Canada
Develop new science and technology to ensure readiness for 2018 launch of the RADARSAT Constellation Mission. Data from the mission would support efforts in maritime surveillance, disaster management and ecosystem monitoring.
Cooperate with the Canadian Environmental Assessment Agency, review boards of the North and other federal stakeholders by providing science-based evidence and information to support environmental assessments.
Public Safety
Analyze and evaluate federal institutions' emergency management plans to assess if the institutions are developing plans to mitigate their identified risks.
Public Services and Procurement Canada
Provide federal contaminated site remediation services/contract administration on an optional fee for service basis.
Implement environmental site assessments and remediation projects for custodial sites.
Transport Canada
Address air pollutant emissions from the rail sector through locomotive regulations aligned with US standards, and research activities to enhance understanding of new technologies to reduce air pollutant emissions.

ANNEX E: STRATEGIC ENVIRONMENTAL ASSESSMENTS

Strategic environmental assessment (SEA) is a process that supports environmentally sustainable decision making. It helps ensure that environmental considerations are integrated into the development of policy, plan and program proposals. The Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals provides the guidelines for conducting an SEA.

Departments and agencies are required to undertake an SEA of policy, plan and program proposals that are being submitted to a minister or to Cabinet for approval and which are expected to result in important environmental effects. These assessments are to consider:

- the scope and nature of potential effects;
- the need for mitigation to reduce or eliminate adverse effects or opportunities to enhance positive effects;
- the scope and nature of residual effects, including any adverse environmental effects after taking into account mitigation measures;
- the need for follow-up; and
- public concerns around the potential environmental effects of the proposal.

In addition, SEAs also identify how the proposals will contribute to achieving the FSDS goals and targets.

When a SEA has been conducted, departments and agencies are required to prepare and post a public statement. This statement describes the potential environmental effects of the policy, plan or program and the impacts on the FSDS goals and targets. Once the proposal is approved or announced, departments and agencies post the public statement on the departmental or agency website.

In this manner, FSDS departments and agencies present a record of their consideration of sustainable development in decision-making. A review of policy documents approved by Cabinet in 2017 showed 27 of the 30 posted public statements identified linkages to the 2016 to 2019 FSDS. Two (2) of the 3 public statements that did not link to the FSDS were of an administrative nature.