

An Evaluation of Environmental Sustainability Reporting in Canada

by

Erin Ellis

B.Sc., Queen's University, 2008

Research Project Submitted in Partial Fulfillment of the
Requirements for the Degree of
Master of Resource Management (Planning)

in the
School of Resource and Environmental Management
Faculty of the Environment

Report No. 584

© Erin Ellis 2013

SIMON FRASER UNIVERSITY

Fall 2013

All rights reserved.

However, in accordance with the *Copyright Act of Canada*, this work may be reproduced, without authorization, under the conditions for "Fair Dealing." Therefore, limited reproduction of this work for the purposes of private study, research, criticism, review and news reporting is likely to be in accordance with the law, particularly if cited appropriately.

Approval

Name: Erin Ellis
Degree: Master of Resource Management (Planning)
Report No.: 584
Title of Project: *An Evaluation of Environmental Sustainability Reporting in Canada*
Examining Committee: **Chair:** Luke Strong-Cvetich
MRM Candidate

Thomas I. Gunton
Senior Supervisor
Professor

Murray B. Rutherford
Supervisor
Associate Professor

Date Defended/Approved: November 12, 2013

Partial Copyright Licence



The author, whose copyright is declared on the title page of this work, has granted to Simon Fraser University the non-exclusive, royalty-free right to include a digital copy of this thesis, project or extended essay[s] and associated supplemental files (“Work”) (title[s] below) in Summit, the Institutional Research Repository at SFU. SFU may also make copies of the Work for purposes of a scholarly or research nature; for users of the SFU Library; or in response to a request from another library, or educational institution, on SFU’s own behalf or for one of its users. Distribution may be in any form.

The author has further agreed that SFU may keep more than one copy of the Work for purposes of back-up and security; and that SFU may, without changing the content, translate, if technically possible, the Work to any medium or format for the purpose of preserving the Work and facilitating the exercise of SFU’s rights under this licence.

It is understood that copying, publication, or public performance of the Work for commercial purposes shall not be allowed without the author’s written permission.

While granting the above uses to SFU, the author retains copyright ownership and moral rights in the Work, and may deal with the copyright in the Work in any way consistent with the terms of this licence, including the right to change the Work for subsequent purposes, including editing and publishing the Work in whole or in part, and licensing the content to other parties as the author may desire.

The author represents and warrants that he/she has the right to grant the rights contained in this licence and that the Work does not, to the best of the author’s knowledge, infringe upon anyone’s copyright. The author has obtained written copyright permission, where required, for the use of any third-party copyrighted material contained in the Work. The author represents and warrants that the Work is his/her own original work and that he/she has not previously assigned or relinquished the rights conferred in this licence.

Simon Fraser University Library
Burnaby, British Columbia, Canada

revised Fall 2013

Abstract

This study describes and evaluates the environmental sustainability reporting practices of the federal, provincial and territorial governments of Canada. Public reporting on progress towards environmental sustainability enhances government accountability, provides accessible, authoritative, and scientific information to stakeholders, and is an important part of the larger environmental sustainability planning systems of governments. Background information on environmental sustainability reporting is provided and reporting practices of each Canadian government are described in detail. The environmental sustainability reporting system for each jurisdiction is evaluated relative to international best practice criteria for environmental sustainability planning systems. The results indicate that there are many opportunities to improve the environmental sustainability reporting practices of Canadian governments.

Keywords: Environmental sustainability; public reporting; monitoring; sustainability reporting; adaptive management; Canada; provinces

I dedicate this work to my Mom and Dad for instilling in me the confidence to pursue my interests and to my husband, Ronnie, for his constant love and support.

Acknowledgements

I would like to thank all the people who have supported me throughout this research project and my time at REM. Firstly, I would like to thank my supervisors Tom Gunton and Murray Rutherford for their guidance, teaching and thoughtful contributions to this project and throughout my experience at REM. I am grateful to the staff and faculty at REM who together made this experience enjoyable and rewarding. I am also grateful for the financial support from SSHRC and SFU. Thank you to all of my wonderful classmates at REM, from whom I learned so much and whose friendships I deeply appreciate. Finally, to my family, thank you is not enough to express my profound gratitude for your love and support.

Table of Contents

Approval.....	ii
Partial Copyright Licence	iii
Abstract.....	iv
Dedication	v
Acknowledgements.....	vi
Table of Contents.....	vii
List of Tables.....	x
List of Figures	xi
List of Acronyms	xii

Chapter 1. Introduction	1
1.1. Introduction	1
1.2. Purpose and Research Question	2
1.3. Methodology	2
1.4. Structure of the Report.....	3
Chapter 1. Introduction	3
Chapter 2. Environmental Sustainability in Canada.....	3
Chapter 3. Monitoring and Reporting on Environmental Sustainability.....	3
Chapter 4. Federal, Provincial and Territorial Reporting Practices.....	4
Chapter 5. Best Practice Evaluation of Monitoring and Reporting by Canadian Governments	4
Chapter 6. Recommendations, Discussion and Conclusion	4

Chapter 2. Environmental Sustainability in Canada.....	5
2.1. Introduction	5
2.2. Sustainable development.....	5
2.2.1. Canada's international commitment to sustainable development	6
2.3. Environmental Sustainability.....	7
2.3.1. The role of government in environmental sustainability	7
2.4. Environmental governance in Canada.....	8
2.4.1. Jurisdiction over the environment.....	8
2.4.2. Inter-jurisdictional coordination and cooperation.....	9

Chapter 3. Monitoring and Reporting on Environmental Sustainability.....	12
3.1. The importance of public reporting on environmental sustainability	12
3.2. Canada's international commitments to monitoring and reporting on environmental sustainability	13
3.3. Monitoring and reporting to improve environmental sustainability performance.....	14
3.4. Monitoring and reporting on environmental sustainability for government accountability and social participation.....	16
3.5. Environmental Sustainability Indicators	18
3.6. Conceptual Frameworks for Monitoring and Reporting	20

3.6.1. Capital approach	21
3.6.2. Driver-Pressure-State-Impact-Response Framework	22
3.6.3. Policy-oriented and outcomes-based frameworks	23
3.6.4. Issue or theme-based frameworks	24
Chapter 4. Federal, Provincial and Territorial Reporting Practices	25
4.1. British Columbia	31
4.2. Alberta	35
4.3. Saskatchewan	38
4.4. Manitoba	42
4.5. Quebec	46
4.6. Nova Scotia	53
4.7. Prince Edward Island	57
4.8. Yukon Territory	62
4.9. Northwest Territories	66
4.10. Canada	71
Chapter 5. Best Practice Evaluation of Monitoring and Reporting by Canadian Governments	76
5.1. Introduction	76
5.2. Methodology	76
5.2.1. Best Practices for Evaluating Environmental Sustainability Reporting	76
Monitoring	78
Adaptive Management	78
5.2.2. Quantifying Best Practice Criteria	81
5.2.3. Data Collection	85
5.2.4. Study Limitations	86
5.3. Evaluation Results	87
5.3.1. Introduction	87
5.3.2. Easily accessible public monitoring information	88
5.3.3. Regular reporting on sustainability progress	89
5.3.4. Clear mandate for regular reporting	90
5.3.5. Independent progress monitoring	92
5.3.6. Environmental categories covered in the report	94
5.3.7. 5.3.7 Indicators assessed relative to targets	95
5.3.8. Indicators assessed relative to trends	96
5.3.9. Indicators assessed relative to other jurisdictions	97
5.3.10. Adaptive Management	98
5.3.11. Summary of Evaluation Results	100
Chapter 6. Recommendations, Discussion and Conclusion	106
6.1. Recommendations and Discussion	106
6.1.1. Government should regularly produce a comprehensive environmental sustainability report	107
6.1.2. Governments should ensure comprehensive reporting by using a breadth of environmental sustainability issues	108

6.1.3. Governments should report against targets, trends and benchmarks to enable performance assessment.....	109
6.1.4. Monitoring results should be used to revise plans and strategies.....	110
6.1.5. Government should provide web-based reporting	111
6.1.6. Governments should consider harmonizing reporting practices	112
Develop a core set of environmental sustainability indicators.....	113
Develop a common approach to reporting including a shared understanding of the purpose and objectives of reporting, the intended audience, and the use of a common conceptual framework.....	115
A shared understanding of the purpose and objectives of reporting.....	115
Establishing the intended audience	116
Choose a common conceptual framework.....	117
6.1.7. Concluding thoughts on harmonization	118
6.2. Recommendations for future research.....	118
6.3. Conclusion	119

References 121

Literature Cited	121
Legislation Cited	126
Appendix. Evaluation Guides for Provincial, Territorial and Federal Governments	127
A. British Columbia	127
Alberta.....	134
Saskatchewan.....	141
Manitoba	146
Ontario	153
Quebec	157
New Brunswick	172
Nova Scotia.....	176
Prince Edward Island.....	180
Newfoundland and Labrador.....	186
Yukon Territory	189
Northwest Territories.....	194
Nunavut.....	201
Canada	203

List of Tables

Table 3.1.	Commonly cited criteria used in the selection of Sustainable Development Indicators	19
Table 4.1.	Descriptive comparison of environmental sustainability reporting practices in Canada	26
Table 4.2.	Selected indicators from Saskatchewan’s 2013 State of the Environment Report	40
Table 4.3.	Examples of Environmental Sustainability Indicators featured under each chapter of the 2009 Provincial Sustainability Report for Manitoba	45
Table 4.4.	Relationship between the three levels of reporting used in Québec’s sustainable development indicator system.	48
Table 4.5.	Selected example of a level 2 indicator that correspond to a given objective and direction of Quebec’s Sustainable Development Strategy 2008-2013.	49
Table 4.6.	Weather Icons.....	55
Table 4.7.	Selected examples of different types of performance objectives found in the PEI 2010 State of the Environment Report.....	59
Table 5.1.	Best Practices identified by Ellis et al. 2010 from a review of thirteen studies on National Sustainable Development Strategies. The monitoring and adaptive management best practices (shaded) are used in this evaluation.	80
Table 5.2.	Criteria for quantitative evaluation of environmental sustainability progress monitoring and reporting, and Adaptive Management (adapted from Ellis et al., 2010).....	82
Table 5.3.	Forty-two environmental categories representing an appropriate set of environmental sustainability indicators for Canada, adapted from Gunton et al. (2006).....	84
Table 5.4.	Findings for best practice evaluation criterion 1 on easily accessible, comprehensive public monitoring information.	88
Table 5.5.	Findings for evaluation criterion 2 on regular public monitoring reporting. ..	89
Table 5.6.	Findings for evaluation criterion 3 on whether there is a clear mandate for environmental sustainability reporting in each jurisdiction.....	90
Table 5.7.	Findings for Evaluation criterion 4 on whether there is environmental sustainability performance monitoring performed by an independent agency in each jurisdiction.	93

Table 5.8. Findings for evaluation criterion 5 on the proportion of environmental categories included in the jurisdictions' environmental sustainability monitoring report.....	94
Table 5.9. Findings for evaluation criterion 6 on the proportion of indicators assessed relative to targets, trends and comparable jurisdictions.....	95
Table 5.10. Findings for evaluation criterion 7 on the proportion of indicators assessed relative to trends.	96
Table 5.11. Findings for evaluation criterion 8 on the proportion of indicators assessed relative to comparable jurisdictions.....	97
Table 5.12. Findings for evaluation criterion 9 on where there is a mandatory review and revision of the jurisdiction's environmental sustainability planning system based on the monitoring results.....	99
Table 5.13. Summary of evaluation results.	102

List of Figures

Figure 3.1. The planning process (Gunton, 2006).	15
Figure 3.2. The planning process, adapted to show the relationship between public reporting on monitoring results and public input into the revision of plans and strategies (Adapted from Gunton, 2006).	17
Figure 4.1. Figure from the level 2 report featuring Quebec's 2012 and 2020 targets for GHG emissions reductions.	51
Figure 5.1. A radar graph showing the evaluation results for monitoring and adaptive management for the provincial, territorial and federal governments.....	105

List of Acronyms

AAC	Annual Allowable Cut
Ai	Active ingredient
AQHI	Air Quality Health Index
AQI	Air Quality Index
AQMS	Air Quality Management System
AQO	Air Quality Objective
BOD	Biochemical Oxygen Demand
CCFM	Canadian Council of Forest Ministers
CCME	Canadian Council of Ministers of the Environment
CDWQG	Canadian Drinking Water Quality Guidelines
CEPA	Canadian Environmental Protection Act
CESD	Commissioner of the Environment and Sustainable Development
CWS	Canada Wide Standard
EGSPA	Environmental Goals and Sustainable Prosperity Act
ESI	Environmental Sustainability Indicator
ESPS	Environmental Sustainability Planning System
EU	European Union
GDP	Gross Domestic Product
GHG	Greenhouse Gas Emissions
GRI	Global Reporting Initiative
IISD	International Institute for Sustainable Development
ISQ	Institut de la statistique du Québec
MAC	Maximum Allowable Concentration
MDDEP	ministère du Développement durable, de l' Environnement et des Parcs
MEA	Millennium Ecosystem Assessment
NAAQO	National Ambient Air Quality Objective
NEG/ECP	New England Governors/Eastern Canadian Premiers
NO ₂	Nitrogen Dioxide
NPRI	National Pollutant Release Inventory
NSDS	National Sustainable Development Strategy

NTU	Nephelometric Turbidity Unit
NWT	Northwest Territories
ODS	Ozone Depleting Substances
OECD	Organization for Economic Cooperation and Development
P/T	Province/territory
PEI	Prince Edward Island
PM	Particulate Matter
REM	Resource and Environmental Management
SARA	Species at Risk Act
SDI	Sustainable Development Indicator
SDS	Sustainable Development Strategy
SFU	Simon Fraser University
SO ₂	Sulphur dioxide
SOE	State or environment
TSP	Total Suspended Particulate
UN DESA	United Nations Department of Economic and Social Affairs
UNCED	United Nations Conference on Environment and Development
UNCSD	United Nations Commission on Sustainable Development
UNDS	United Nations Division for Sustainability
VOC	Volatile Organic Compounds
WCED	World Commission on Environment and Development
WQI	Water Quality Index

Chapter 1.

Introduction

1.1. Introduction

Canada made a commitment to sustainable development at the 1992 Earth Summit in Rio de Janeiro. Two major outcomes of the summit – the Rio Declaration on the Environment and Agenda 21 – call on signatories to provide the public with information on environmental sustainability and to monitor and report on progress using environmental sustainability indicators (United Nations, 1992; UNDS, 1993). The information collected by the monitoring and reporting program should be used to assess the effects and impacts of policy interventions, and to revise policies and programs in an iterative process to improve their effectiveness, and adapt to new circumstances and priorities.

Indicators are an effective tool to further sustainability because they lie at the nexus between public policy and science (IISD, 2005). They can be used to measure progress, signal environmental changes, enhance accountability, and communicate important information to stakeholders. Economic and social indicators include GDP, employment rates, literacy rates, and gender gaps, among many others. Environmental sustainability indicators (ESIs), the focus of this report, include indicators such as greenhouse gas emissions, species status, and water quality, among others, and are used to detect trends, signal environmental change, communicate important scientific information, and track the progress of governments, industries and other actors.

In Canada, constitutional jurisdiction over the environment is shared between the federal and provincial governments. Due to this division of power, each government is responsible for certain aspects of environmental management, including monitoring and reporting on the state of the environment and progress towards environmental

sustainability. While there are many efforts made to coordinate approaches between provinces, territories and the federal government, each government is responsible for developing its own system for environmental monitoring and reporting.

1.2. Purpose and Research Question

The purpose of this study is to evaluate environmental sustainability reporting systems and practices of the provincial, territorial and federal governments of Canada to determine whether they meet international best practices. In this study, I address the following research question:

Have the federal, provincial and territorial governments developed effective environmental performance monitoring and reporting in order to assess progress toward environmental sustainability?

This research identifies strength and weaknesses in public environmental reporting. It includes descriptions of the different approaches taken by the provinces, territories and federal government to report on the state of the environment and progress on sustainable development objectives. The evaluation provides an assessment of the quality and comprehensiveness of the monitoring and reporting practices of each government

1.3. Methodology

The research was conducted in a five-step process:

- A comprehensive review of federal, provincial and territorial environmental sustainability reporting systems was completed to identify legislative requirements, frameworks and practices relevant to sustainability monitoring and reporting.
- The environmental sustainability reports produced by the provinces, territories and federal government were described in detail.
- International best practices for monitoring, reporting and adaptive management were identified based on a review of best practice criteria for the evaluation of Environmental Sustainability Planning Systems by the Sustainable Planning Research Group of the School of Resource and Environmental Management at Simon Fraser University (Gunton and Joseph, 2006; Ellis *et al.*, 2010).

- Data on federal, provincial and territorial environmental sustainability monitoring and reporting systems was collected and evaluated. The extent to which the international best practice criteria are met is based on either quantitative assessment or, where quantitative information is not available, a qualitative assessment using the following four-point scale: not met, partially met, largely met, or fully met.
- Conclusions on the strengths and weakness of the monitoring and reporting approaches taken by each jurisdiction were drawn and recommendations for improvement were made.

1.4. Structure of the Report

Chapter 1. Introduction

The first chapter includes an overview of the research objectives, methodology and structure of the report.

Chapter 2. Environmental Sustainability in Canada

Chapter 2 describes the context for environmental sustainability reporting in Canada. Background information is provided on the concepts of sustainable development and environmental sustainability and the role of government in achieving these goals. Environmental jurisdiction and governance in Canada are also discussed.

Chapter 3. Monitoring and Reporting on Environmental Sustainability

Chapter 3 features a discussion on the importance of environmental monitoring and reporting in order to advance environmental sustainability. Background information on Canada's commitments to monitoring and reporting is provided as well as the role of monitoring and reporting in performance improvement, government accountability and transparency, and social participation. Finally, environmental sustainability indicators are described and common reporting frameworks are reviewed.

Chapter 4. Federal, Provincial and Territorial Reporting Practices

Chapter 4 features a description of the environmental sustainability reporting practices of provinces, territories and federal government. A summary table featuring a descriptive comparison of reporting practices in Canada is provided.

Chapter 5. Best Practice Evaluation of Monitoring and Reporting by Canadian Governments

Chapter 5 contains the evaluation of environmental sustainability reporting systems based on international best practice criteria. The evaluation methodology is described, including the best practice criteria and data collection. The degree to which provincial, territorial and federal government practices meet international best practices for monitoring, reporting and adaptive management is evaluated.

Chapter 6. Recommendations, Discussion and Conclusion

Chapter 6 features a discussion on the strengths and weaknesses of provincial, territorial and federal reporting practices. Recommendations for improvements and future direction for environmental sustainability reporting in Canada are provided as well as final conclusions and recommendations for future research.

Chapter 2.

Environmental Sustainability in Canada

2.1. Introduction

This chapter describes the context for environmental sustainability reporting in Canada. Background information is provided on the concepts of sustainable development and environmental sustainability and the role of government in achieving it. Environmental jurisdiction and governance in Canada are also reviewed.

2.2. Sustainable development

In 1987, the United Nations convened the World Commission on Environment and Development (WCED) (also known as the Brundtland Commission) to address concerns over the accelerating deterioration of the health of the natural environment, and its implications for future economic and social development. The report from this commission, *Our Common Future* (1987), defined sustainable development as follows:

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. (WCED 1987, 43)

Since 1987, there have been numerous definitions and interpretations of sustainability and sustainable development, reflecting the diversity of values and opinions on its theory and practice (Johnston *et al.*, 2007). Underscoring the many viewpoints is the interpretation that sustainable development is a long-term endeavour involving the integration of three interconnected pillars: environment, society and economy.

Sustainable development has great implications for how governments, companies and citizens perceive their activities, roles and responsibilities. The interconnected nature of sustainable development implies that these actors cannot pursue economic growth strategies without considering and integrating the social and environmental implications of their actions and decisions. The Organisation for Economic Co-operation and Development (OECD) (2008a) characterizes sustainability in three ways:

- A conceptual framework: a way of changing the predominant world view to one that is more holistic and balanced;
- A process: a way of applying the principles of integration – across space and time – to all decisions; and
- An end goal: identifying and fixing the specific problems of resource depletion, health care, social exclusion, poverty, unemployment, etc.

2.2.1. Canada's international commitment to sustainable development

The federal, provincial and territorial governments in Canada have made commitments to achieve sustainable development – or aspects thereof – in international, bilateral, provincial and regional forums. The federal government alone is a signatory to over 100 international environmental agreements on issues such as ocean pollution, fishery conservation, and the protection of endangered species (CESD, 2008a). The most significant is perhaps Canada's commitment to pursue sustainable development at the 1992 United Nations Conference on Environment and Development (UNCED). The definition of sustainable development agreed to at the 1992 UNCED – the same one developed by the WCED – was incorporated into the Canadian *Federal Sustainable Development Act* in 2008. Two major outcomes from the 1992 UNCED, were the Rio Declaration on the Environment to which Canada is a signatory, and Agenda 21, the action program negotiated and adopted at the conference that describes an approach to sustainable development to be implemented at global, national and local levels.

2.3. Environmental Sustainability

This study focuses on the environment pillar of sustainable development, referred to herein as environmental sustainability. Environmental sustainability is concerned primarily with the conservation and enhancement of physical and biological characteristics of the earth (UN DESA, 2002). *Our Common Future* (WCED, 1987) underscored the importance of the interconnectedness between environment and development in the foreword, which states that "the environment does not exist as a sphere separate from human actions, ambitions, and needs, and therefore it should not be considered in isolation from human concerns. The environment is where we all live; and development is what we all do in attempting to improve our lot within that abode. The two are inseparable." (WCED, 1987, Chairman's foreword)

2.3.1. The role of government in environmental sustainability

Governments are central to the implementation of sustainable development. Essentially, governments make decisions on what is important to a society and how these important issues should be managed. To further sustainable development governments can use their powers of taxation and regulation to impose costs and influence or control behaviours associated with environmental protection, reduce the impact of public operations, and use their influence to encourage environmental actions in others. Many sustainable development issues involve market failures, such as negative externalities (where the cost of a decision does not include all external costs to society, e.g. when a coal plant emits carbon dioxide without penalty). Government's powers to tax and regulate are key to addressing these issues, integrating environmental and social costs in economic decision-making. Second, the government is responsible for improving the sustainability of its own operations. Combined, the federal, provincial and territorial governments are the largest landowners and largest employers in Canada. They control large fleets of vehicles, own and/or operate many buildings and procure a vast amount of goods and services. By furthering sustainable development in their own work, governments can make large gains and set an example for others. Lastly, governments can provide support, education and leadership through their responsibilities for data gathering and analysis, information dissemination, and co-ordination (Bell, 2002). Although sustainable development began as a project for

governments, governments on their own cannot achieve the far-reaching social and economic changes that sustainability requires (Bell, 2002). An important role for governments is to engage individual citizens, private enterprise, and civil society in pursuing environmental sustainability goals.

2.4. Environmental governance in Canada

2.4.1. Jurisdiction over the environment

Canada is a constitutional monarchy and a federal state founded by the *British North America Act, 1867*; revised and renamed the *Constitution Act, 1867* (OECD, 2002). The *Constitution Act, 1867* lays out the distribution of powers between the federal and provincial governments. The *Constitution Act* does not explicitly address the environment, but grants both the federal and provincial governments powers to pass legislation over various matter related to the environment.

The federal government has constitutional powers to enact laws concerning interprovincial and international trade and commerce, fisheries, and crime. It also holds residual powers over issues of peace, order and good government that can be applied to environmental matters. The federal government also holds responsibility for federal Crown lands, including most land in the territories as well as military bases, national parks, and Indian reserves. Furthermore, many issues are subject to both federal and provincial regulation necessitating a coordinated approach, such as agriculture, health, species at risk, air quality and climate change (CESD, 2000). While the federal government's international commitments to sustainable development are not binding for the provincial and territorial governments, the federal government enters into many agreements and initiatives with its provincial counterparts on a variety of issues, discussed in the next section.

In many areas of environmental management and sustainability planning, provinces are the key players. Provinces have jurisdiction over the management of provincial Crown lands, property, civil rights and municipal affairs. Importantly, the provinces have clear authority over the development and use of natural resources within the provinces, as per sections 92 and 92A of the *Constitution Act, 1867*. This is perhaps

the most significant constitutional power related to environmental sustainability in Canada. Provincial jurisdiction over provincial Crown lands is also very significant, however the proportion of Crown lands in each province varies significantly.

Canada's territories are not constitutionally recognized entities and instead fall under the legislative responsibility of the federal government. In practice however, territories operate in much the same way as their provincial counterparts. The federal Crown has retained some authority over natural resources. However some of these powers are being devolved to territorial governments.

Due to the shared and implicit nature of constitutional jurisdiction over the environment, overlapping authority presents a challenge to environmental management and sustainability planning over already challenging and complex issues, necessitating coordination and cooperation in certain areas.

2.4.2. Inter-jurisdictional coordination and cooperation

Environmental management in Canada is complicated by shared jurisdiction between federal and provincial governments, differences in provincial and territorial resource endowments, as well as regional and provincial differences in norms and values concerning environmental and resource management policies. Contentious resource development projects that are perceived to conflict with over-arching policy objectives can revive tensions between provinces and with the federal government. However, policy coherence¹ between levels of government can facilitate the efficient and effective implementation of mutually beneficial policy actions (OECD, 2003). In recognition of the benefits of a coherent approach, there has been a concerted effort over the past several decades to build institutional arrangements that facilitate coordination and cooperation in the pursuit of environmental sustainability.

Inter-jurisdiction coordination and cooperation is achieved in several ways in Canada. The most formal arrangements are signed agreements between the different

¹ Policy coherence is defined by the OECD as “the systematic promotion of mutually reinforcing policy action across government department and agencies creating synergies towards achieving the agreed objective”. (OECD, 2003, p.2)

levels of government. The federal government often enters into agreements with provinces in order to implement federal legislation. For instance, under the *Canadian Environmental Protection Act*, provincial governments can enter into equivalency agreements with the federal government upon demonstrating their ability to achieve equivalent outcomes through provincial regulations. Another example is the *Accord for the Protection of Species at Risk* that was signed by all Canadian jurisdictions in 1996, and commits the provinces and territories to work with the federal government to protect and recover species at risk. The federal *Species at Risk Act* (SARA), which came into force in June 2004, was the federal government's legislative response to the Accord. Provincial and territorial efforts are also necessary to ensure that the federal government meets its international obligations. For instance, Ontario imposes a cap on nitrogen oxide emissions from industrial facilities in order to meet Canada's obligations for the Ozone Annex under the *Canada-US Air Quality Agreement for the Pollutant Emissions Management Area* (Ontario Ministry of the Environment, 2005).

The federal government often works with the provinces and territories to establish voluntary objectives of environmental performance that the provinces and territories can then choose to adopt. The National Ambient Air Quality Objectives (NAAQO) is an example of this. Established under CEPA following the recommendations of an inter-jurisdictional working group, the provincial governments can choose to adopt the NAAQOs as objectives or enforceable standards according to their legislation. An example of a new voluntary standard for reporting is the Air Quality Health Index (AQHI), developed by Health Canada and Environment Canada, in collaboration with the provinces and key health and environment stakeholders. The AQHI replaces the Air Quality Index, and provides greater focus on the health impacts of poor air quality. It is currently being adopted for use by the provinces. Another example is Health Canada's Canadian Drinking Water Quality Guidelines (CDWQG). Through the Federal-Provincial-Territorial Committee on Drinking Water, Health Canada provides assessments of exposure and impact of selected contaminants in order to establish the national drinking water quality guidelines, which some provinces have adopted in regulations (Alberta, Ontario and Quebec) and others have adopted as standards.

The provincial, territorial and federal governments also enter into regional and bilateral cooperation on issues of interest. Recently, there has been significant regional

cooperation on the issue of climate change. Inter-jurisdictional climate change initiatives such as the Western Climate Initiative, the Climate Registry, the Provincial and Territorial Gas Cap and Trade Initiative Memorandum of Understanding, and the New England Governors/Eastern Canadian Premiers Conference, involve many Canadian provinces as well as American and Mexican states. (Provincial-Territorial Cap and Trade Initiative Memorandum of Understanding, 2008; NEG/ECP, 2011; Western Climate Initiative, 2013; The Climate Registry, 2013)

Another means of coordination is through ministerial councils and committees that are formed with provincial, territorial and federal representation. The Canadian Council of Ministers of the Environment (CCME) is the primary forum for intergovernmental discussion and co-operation on environmental issues with an inter-jurisdictional or international scope. The council is comprised of the environment ministers from the federal government and 13 provincial and territorial governments. The CCME works on a diversity of issues of interest to its members, including a Canada-wide Action Plan for Extended Producer Responsibility, Canada-wide Air Quality Management System, a Canada-Wide Strategy for Municipal Wastewater Effluent, and many others. Many of the environmental quality standards used and reported on by the provinces and territories are derived from work done by the CCME. In 1998, the CCME, except for Quebec, signed the Canada-wide Accord on Environmental Harmonization, designed to improve cooperation and environmental protection across Canada. From this accord, the Canada-wide Environmental Standards Sub-Agreement was signed, from which the Canada-wide Standards (CWS) for environmental protection were developed. So far there are ten CWS endorsed by the signatories including standards for benzene, mercury emissions, particulate matter and ground level ozone and petroleum hydrocarbons in soil. Nearly every province and territory that publishes a report on environmental sustainability, reports on the achievement of the Canada-Wide Standard for Particulate Matter and Ozone. Furthermore, CCME itself publishes progress and performance reports on behalf of the provinces. CCME also developed the Canadian Environmental Quality Guidelines, along with their associated implementation guidance, to provide governments and other organizations with nationally endorsed science based goals for air, water, soil, sediment, and tissue quality.

Chapter 3.

Monitoring and Reporting on Environmental Sustainability

This chapter features a discussion on the importance of environmental monitoring and reporting in order to advance environmental sustainability. Background information on Canada's commitments to monitoring and reporting is provided as well as a discussion of the role of monitoring and reporting in performance improvement, government accountability and transparency, and social participation. Finally, environmental sustainability indicators are described and common reporting frameworks are briefly introduced.

3.1. The importance of public reporting on environmental sustainability

Governments are central to the advancement of sustainable development and are responsible for fostering progress and performance improvement in order to meet international and domestic commitments. In doing so, governments must monitor and track their own performance and environmental outcomes as well as provide support and leadership to other sectors of society in order to achieve the far-reaching social and economic changes that sustainability entails (Bell, 2002).

The Bruntland definition of sustainable development has been called “confusing”, “vague”, and “symbolic rhetoric” (Jabareen, 2008, p. 179–180). The all-encompassing nature of the concept forces governments and others to define what it means for them, how it will be approached and what success will look like. Ball and Grubnic (2007, p. 244) argue that governments are required to translate “the heroic demands of the environmental agenda into tangible policies and programmes, and thus giving substance to the idea of living sustainably on the planet”. Monitoring and reporting on

environmental sustainability, and on sustainable development more broadly, is a central practice to this translation from ambiguous concept to distinctive practice.

3.2. Canada's international commitments to monitoring and reporting on environmental sustainability

Reflecting the importance of monitoring and reporting practices in furthering progress on sustainable development, both the Rio Declaration and Agenda 21 call on governments to monitor and report on the state of their environment and progress towards sustainable development.

The Rio Declaration on the Environment contains the fundamental principles on which nations have agreed to base their approach to sustainable development. Principle 10 addresses the provision of public information on environmental sustainability issues as follows:

Environmental issues are best handled with the participation of all concerned citizens, at the relevant level. At the national level, each individual shall have appropriate access to information concerning the environment that is held by public authorities, including information on hazardous materials and activities in their communities, and the opportunity to participate in decision-making processes. States shall facilitate and encourage public awareness and participation by making information widely available. [...] (Principle 10, Rio Declaration on the Environment, United Nations, 1992)

While this principle does not explicitly call for sustainability reports, it does call on states to provide information concerning the environment and to facilitate and encourage public awareness and participation by making such information widely available.

Chapter 40 of Agenda 21 is more explicit on the types of information that should be provided through monitoring and reporting practices by states. It calls on governments to ensure that their citizens and resource users have the information they need to make decisions that encourage sustainable development, including information on the status of air quality, fresh water, land resources, biodiversity, the marine environment and the atmosphere. In Chapter 40 of Agenda 21, governments are encouraged to adopt national accounting practices and measures that adequately reflect the environmental costs of development. To achieve environmental sustainability,

Agenda 21 calls on countries to strengthen their capacity to collect, interpret, disseminate and apply information relevant for decision-making, including the use of sustainable development indicators (SDIs) for tracking and communicating on progress (Chapter 40, Agenda 21, UNDS, 1993).

3.3. Monitoring and reporting to improve environmental sustainability performance

In order to meet their commitments to sustainable development, governments must ensure that they are making progress on environmental sustainability. Monitoring and reporting on environmental sustainability holds governments accountable for progress on their goals and strategies, provides important information to decision-makers, and ensures that governments measure and assess their performance (European Union, 2011). It helps decisions-makers to understand the direction of change and the effects of policies, programs, and interventions. Given increasing global attention to the environmental risks of human activities, Canada's international reputation depends in part on the government's ability to demonstrate progress on this international agenda item and to meet its commitments under international agreements (CESD, 2008a).

Monitoring and reporting functions are integrated into several phases of the planning process. Figure 1 is a representation of the basic steps involved in a planning process (Gunton, 2006). Firstly, data on the state of the environment and the pressures exerted upon it inform the identification of goals, objectives and targets. Following the selection of a strategy, indicators are developed for progress monitoring. The information garnered from monitoring these indicators throughout the implementation of the strategy enables government to assess progress, evaluate outcomes and learn from successes and failures (UN DESA, 2002). Finally, this information is used to inform the revision of the strategy in an iterative process to improve its effectiveness, and to adapt to new circumstances and priorities (IISD, 2005).



Figure 3.1. The planning process (Gunton, 2006).

Data collected from environmental sustainability indicators, especially when considered alongside data on economic and social issues, can be used to increase a government's understanding of the effectiveness of its actions as well as emerging risks and opportunities. This information then feeds back into management policies, strategies and business plans in order to mitigate or reverse negative environmental, social and/or economic impacts. It also informs government decisions on what types of development are appropriate and whether the economy is operating in a way that preserves environmental sustainability over time. Efforts to balance environmental protection, economic growth, standards of living and equitable access to resources will involve multiple experiments, learning, failures, mistakes and a constant effort at adapting and refining methods (Lee, 1993).

Environmental sustainability monitoring and reporting is particularly important as governments face new challenges related to increasing ecological uncertainties, such as rapid ecosystem changes and thresholds. As ecosystems are increasingly degraded, they become less resilient to external pressures, which can lead to the rapid loss of

ecosystem function as the system crosses a threshold into an alternative state (Scheffer *et al.*, 2001). These rapid and unexpected changes, interactions, and thresholds necessitate policy interventions that respond and adapt efficiently to signals of environmental change in order to avert major and irreversible biodiversity losses (Federal, Provincial and Territorial Governments of Canada, 2010).

Developing measures of environmental sustainability is not a purely statistical or technical exercise. In light of future uncertainties, developing appropriate measures of environmental sustainability, and sustainable development more generally, requires value-based judgement as to what is important and what trade-offs are acceptable. In order to effectively make these judgements, governments require input and direction from an informed and engaged public.

3.4. Monitoring and reporting on environmental sustainability for government accountability and social participation

In addition to their role in performance management, monitoring and reporting are also important tools for democratic engagement in government actions on sustainable development. Over the past two decades of progress on sustainable development, one of the greatest obstacles has been the inherent difficulty in changing people's perception and actions. Monitoring and reporting touch on two very important issues at the interface between governments and their citizens: government accountability and social participation (OECD, 2008a). Reporting on monitoring results improves transparency and accountability, and can give citizens information to better understand and participate in defining policy goals, and assessing environmental sustainability. Figure 2 illustrates the role that an informed civil society can play in the planning process when a government reports publicly on monitoring results. Citizens are able to use monitoring information to provide feedback to governments as to which factors are important for managing over time, and how policies and strategies should be revised to account for new information.



Figure 3.2. The planning process, adapted to show the relationship between public reporting on monitoring results and public input into the revision of plans and strategies (Adapted from Gunton, 2006).

Governments, as agents of the public, should be accountable to their citizens for government decisions, activities and performance in substantial detail (Barton, 2005). As such, governments must conform to societal expectations that they will manage public resources in a sustainable manner. In order for effective management of ecosystems, the Millennium Ecosystem Assessment calls for “increased transparency and accountability of government [...] in decisions that affect ecosystems, including through greater involvement of concerned stakeholders in decision-making” (MEA, 2005, p.93). Through environmental sustainability reporting, governments can influence others to adopt sustainable practices. According to the Global Reporting Initiative “given their size and influence, public agencies are expected to lead by example in reporting publicly and transparently on their activities to promote sustainability” (GRI, 2005, p. 7). Governments have a number of politically active stakeholder groups, including Aboriginal communities and organisations, labour groups, environmental organizations, business and industry, all of whom require reliable and timely information on government activities and the state

of the environment to effectively further sustainable development through their own actions and decisions.

An informed civil society is fundamental to the efficient and effective implementation of sustainable development. Environmental sustainability reports from governments can provide authoritative, science-based information as to the most important issues facing the jurisdiction, progress in key areas, and areas for increased attention and intervention. These reports often include a variety of information beyond environmental monitoring data, such as case studies, program descriptions and other resources, to encourage non-government actors to adopt environmentally sustainable behaviours and to support government interventions and policies that protect the environment.

3.5. Environmental Sustainability Indicators

It is difficult to measure the state of the environment and the pressures that are being exerted on it. The natural environment is in a state of flux, responding to climatic variations, dynamic species interactions, and the pressures of human activities. While it may be desirable to measure and model every aspect of the environment and how it changes and interacts with human society, this is not feasible. Governments must rely on indicators that they can measure to infer environmental sustainability.

Environmental sustainability indicators provide snapshot information on a given aspect of the environment at a given time. When tracked over time, these indicators provide information on the nature and direction of change in the system (World Bank, 2002). Using this information, governments and stakeholders can infer qualities of the environment as well as the effects of human activities and government policies and programs (OECD, 2008a).

Indicators can be used to measure all three dimensions of sustainable development: economic, social, and environmental. Economic and social indicators measure issues such as employment, inflation, education, equality, economic growth, and health. Environmental sustainability indicators (ESIs), the focus of this report, are used to signal environmental change, detect trends, communicate with the public, and

track the progress of governments and industry. While governments have been tracking and reporting important social and economic statistics for decades, data on environmental sustainability has traditionally been less available and comprehensive (CESD, 2008b).

Measuring progress on environmental sustainability requires governments to develop a set of indicators that reflect the environmental factors that contribute to ecosystem function and human wellbeing and can be tracked and assessed over time. There is no prescribed set of indicators for environmental sustainability as different countries and jurisdictions will have different resources, social values and economic structure. What is considered important for sustainability will depend on factors that vary from place to place such as the quality and quantity of water and land, air quality, income and inequality, access to different types of energy, major sectors of the economy, and other factors (OECD, 2008b). As a result, there is a tension between the selection of common, standardized indicators that can be used to compare and benchmark jurisdictions and those indicators that reflect a state’s unique social values and the characteristics of its economy and environment (CESD, 2008b).

When selecting and developing environmental sustainability indicators, there are many considerations a government must take into account. Commonly cited criteria used in the selection of SDIs are:

Table 3.1. Commonly cited criteria used in the selection of Sustainable Development Indicators

<ul style="list-style-type: none"> • Relevance to decision makers and stakeholders • Accuracy and data quality • Timeliness • Limited in number • Broad coverage of sustainability • Adaptable to future needs 	<ul style="list-style-type: none"> • Interpretability / ease of use • Coherence / conceptually sound • Collection and development costs • Comparability with other jurisdictions
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Sources: US Interagency Working Group on Sustainable Development Indicators, 1998; UNDESA, 2007; CESD, 2008b; OECD, 2008a; OECD 2008b.

The end goal of indicator use is to gather improved information for decision-making (World Bank, 2002). When selecting and developing indicators, governments

must choose those measurable aspects that can be analyzed to give information on environmental change that is useful in decision-making by governments and stakeholders (World Bank, 2002). Governments should identify indicators that are directly relevant to their objectives as well as how the information gleaned from these indicators will inform their approach and contribute to an improved or protected state of the environment over time (World Bank, 2002; CESD, 2008b).

While it is important for governments to select indicators that will give information on progress towards addressing a given problem, publically reported indicators must be easily understandable and reflect issues that are important to stakeholders. In this way, governments may require a comprehensive, detailed set of environmental sustainability indicators to monitor performance towards their objectives, while using a subset of “headline” indicators to communicate this performance to stakeholders. Publically reported environmental sustainability indicators are tools for communication and engagement. They are often developed using processes involving non-expert citizen participants, government bureaucrats and technical experts. This process allows participants to define locally relevant aspects of sustainability that reflect their unique values and perspectives.

There are many common challenges faced by governments in the selection and development of environmental indicators. Data quality and availability are two of the most ubiquitous problems (OCED, 2008b). There are also other technical problems, such as lack of common definitions and long-term, consistent monitoring programs (IISD, 2005). Governments also struggle to find a balance between using complex technical indicators that are meaningful to resource managers, and using more simple indicators of interest to laypersons. Furthermore, some data collected at considerable cost have little apparent use in decision-making (IISD, 2005).

3.6. Conceptual Frameworks for Monitoring and Reporting

Sustainability reporting frameworks provide structure for reporting on sustainable development indicators in order to facilitate the interpretation of information, ensure that indicators reflect a breadth of information, and demonstrate the interrelation between certain issues (World Bank, 2002). Well-defined conceptual frameworks and indicators

help to orient readers by providing structure for understanding the complex nature of sustainability.

Early sustainable development monitoring and reporting efforts attempted to be comprehensive, sometimes including as many as several hundred indicators (OCED, 2008b). These large indicator sets were difficult to manage and presented challenges to the interpretation and communication of findings to non-experts. Sustainable development indicator frameworks have evolved over time and it is now common practice for governments to select indicators according to an established conceptual framework.

The following section provides descriptions of four commonly used approaches in sustainability reporting: the capital-based approach, the drive-pressure-state-impact-response approach, the policy-oriented approach and the thematic approach. While these frameworks are seen most often, others may be used depending on the objectives of reporting, sustainable development policies, data availability, the needs and expectations of the audience, and the resources of the government. For the most part, Canadian federal, provincial and territorial governments that report on environmental sustainability have used or adapted one or more of these four frameworks.

3.6.1. Capital approach

From a capital perspective, sustainable development can be defined as non-declining per capita wealth over time (United Nations *et al.*, 2003). Individual jurisdictions may describe their capital stocks in several different ways. The OECD (2008b) identifies five stocks of capital that should be considered under sustainable development: financial, produced, natural, human, and social. Financial capital is the money, including stocks and bonds, provided by lenders and investors to businesses to produce goods and services. Produced capital includes all types of infrastructure, such as buildings, transportation routes, machinery, and telecommunications. Natural capital occurs in the form of natural resources, such as land, trees, minerals, and water, as well as ecosystem services like waste absorption and water purification. Human capital is measured by education, productivity and health. Finally, social capital is the social networks and institutions that facilitate the effective functioning of society.

The capitals-based approach puts sustainability into concrete terms that can be measured over time. It can also be used to illustrate the trade-offs that occur between types of capital. For instance, as one capital stock declines, such as petroleum or mineral wealth, is it being offset by another type of wealth such as human or natural capital?

Some of the issues with this approach include uncertainty on how different types of capital contribute to wellbeing, how to measure and compare different types of capital, and which types of capital will be required by future generations and therefore, what should be the substitutability between and within different forms of capital (OECD, 2008b). Due to these issues, non-declining per capita capital stocks over time may not guarantee sustainability.

3.6.2. Driver-Pressure-State-Impact-Response Framework

The Driver-Pressure-State-Impact-Response (DPSIR) framework endeavours to characterize the relationships between humans and their environment based on an operational cycle. In this framework a driver, such as industry activity, social structure or climate change, produces a pressure on the environment, such as polluting emissions or water withdrawals, which then affects the state of the environment (World Bank, 2002). Under this framework, governments and others use information from indicators in each category to develop responses, such as regulations, programs, education or taxation, designed to intervene in this cycle to alleviate environmental degradation (World Bank, 2002). While the framework has been primarily used to describe the environmental pillar of sustainability, economic and social drivers are often included.

A strength of this approach is that it reflects an operational cycle that can be interpreted as a cycle of continuous improvement, where response interventions are tracked and monitored to understand their effectiveness and then are revised to achieve the desired effect. A limitation of the DPSIR framework is that it does not work if there is insufficient evidence to identify causal linkages between the different categories of the cycle. Similarly, this framework often over simplifies the interconnectedness between drivers, pressure and states due to the fact that there are often multiple drivers and pressures for most states and multiple states arising from most pressures (IISD, 2005).

The original version of the framework was called the Pressure-State-Response (PSR) framework and was originally developed for environmental statistics in Canada. This PSR framework has since been developed and adapted by the OCED and the United Nation Commission on Sustainable Development and has been used for national, regional and international level analysis (IISD, 2005). The most recently developed version of the framework, the DPSIR, was adopted by UNEP for use in the Global Environment Outlook (GEO 1997, 1999 and 2002). Many jurisdictions, including several Canadian provinces, continue to report on environmental sustainability using the DPSIR or its variations.

3.6.3. Policy-oriented and outcomes-based frameworks

Many jurisdictions choose to adopt a reporting approach that consists of a core set of indicators, or “headline indicators” as they are often called, that are closely linked to policy objectives, such as those set out in a sustainable development strategy. This reflects a pragmatic approach to sustainable development where key indicators are used to measure progress and communicate on issues of high importance to policy makers and the public (IISD, 2005). In some cases, the policy framework in effect determines the indicators (OECD, 2008b). This approach allows policy makers to monitor and communicate on the effectiveness and outcomes of their interventions. This close relationship between policy and measurement should generate important information to inform subsequent sustainable development strategies and facilitate continuous improvement.

A limitation to this approach is that indicators closely linked to policy objectives may reflect bias towards a particular policy priority at the expense of other important aspects of sustainable development (IISD, 2005; OECD, 2008b). Another drawback to having very close alignment between indicators and policies is that, should the policy change the indicator must be adapted as well. For instance, the United Kingdom’s first three sustainable development strategies were accompanied by three associated indicators sets (OECD, 2008b). Finally, where policy goals are very specific to a jurisdiction, policy-oriented indicators may not allow for meaningful comparison with other jurisdictions.

3.6.4. Issue or theme-based frameworks

Many governments have adopted theme-based indicator frameworks, as they are flexible and can be tailored to serve many functions (UNDESA, 2007). According to the UNCSD (2000), the principal objective of creating a framework formed by Themes and Sub-themes that conceptualize sustainability is to support policy makers in their decision-making at a national level. Thematic frameworks can be linked to policy processes, tailored for effective public communication, and in many cases, are developed to reflect broad issues of interest to many jurisdictions to encourage uptake and comparability. Theme-based frameworks that include general indicators that facilitate inter-jurisdictional comparison can be a driver for continuous improvement. Thematic frameworks are also used in conjunction with the other approaches described above to organize the indicators. By adapting a theme-based approach to the circumstances and values of the jurisdiction, governments can choose indicators that measure the effectiveness of various policy processes and that provides stakeholder and citizens with the information that is important to them (UN DESA, 2007).

Chapter 4.

Federal, Provincial and Territorial Reporting Practices

This chapter describes the environmental sustainability reporting practices of Canadian provinces and territories and of the federal government. Only those jurisdictions that regularly report on progress towards environmental sustainability, or sustainability in general are reviewed. Ontario, Newfoundland and Labrador, and Nunavut do not publish such reports, and New Brunswick last published a report in 2003 and is therefore too out of date to consider.

Table 1 on the following page provides a descriptive comparison of reporting practices in Canada, including the dates of recent reports, the report format, the conceptual framework used, the scope of the report, the number of indicators used, the stated purpose (if provided), and the organization that developed the report. This information is also described in detail in text along with descriptions of the information in the reports that contribute to government performance management, public education and social participation, and government transparency and accountability.

A detailed evaluation of the monitoring and reporting practices of provinces, territories and the federal government is featured in Chapter 5.

Table 4.1. Descriptive comparison of environmental sustainability reporting practices in Canada

P/T/F	Title of most recent report	Date of last report	Previous reports	Format	Framework	Scope	Indicators	Purpose	Development
BC	Environmental Reporting BC	2012 (update)	2007 2002 2000 1998 1993	Online	Theme-based (some DPSIR adaptation)	Environment	35 indicators	"... to provide the basis for informed decision making so that individuals, agencies and policy-makers can take positive action."	Ministry of Environment with contributions from several organizations (NGOs, academia) and other provincial and federal ministries
AB	State of the Environment Report	2012 (update)	-	Online	DPSIR adaptation with themes	Environment	40 indicators	None provided	Department of Environment and Sustainable Resource Development, with other departments.
SK	Saskatchewan's 2013 State of the Environment Report	2013	2011 2005 2003 Regional and issue-specific reports 2007-2012	PDF	DPSIR adaptation with themes	Environment	17 indicators	"... to raise awareness and understanding of the environment, identify emerging issues and trends, and to highlight the actions needed by the public, First Nations and Métis, industry, business, government and non-government organizations to improve the way we use, manage and balance the environment with a growing and dynamic resource economy."	Saskatchewan Ministry of Environment and the Water Security Agency

P/T/F	Title of most recent report	Date of last report	Previous reports	Format	Framework	Scope	Indicators	Purpose	Development
MB	2009 Provincial Sustainability Report for Manitoba	2009	2005 1997 Issue-specific report 2006	PDF	Themes	Environment, economy and society	45 indicators	"... to provide Manitobans with timely, accurate information on important sustainability issues and trends."	Collaborative effort across government departments. Indicators were chosen based on recommendations from the Manitoba Round Table for Sustainable Development
ON	No comprehensive report	-	Issue-specific reports 2006-2011	-	-	-	-	-	-
QC	Level 1. Sustainable development indicators, and Level 2. Indicators for monitoring objectives of the government's sustainable development strategy	2013 (update)	2009	Online/ PDF	Level 1 – capitals approach Level 2 – policy-oriented approach	Environment, economy and society	Level 1 – 20 indicators Level 2 – 84 indicators	"... to aid in decision - making and the revision of sustainable development policies or strategies by the authorities that put them in place; to inform citizens (educational and motivational function); to measure observable progress or setbacks (evaluation); [and] to compare Québec with other states."	Institut de la statistique du Québec et ministère du Développement durable, de l'Environnement, de la Faune et des Parcs du Québec.

P/T/F	Title of most recent report	Date of last report	Previous reports	Format	Framework	Scope	Indicators	Purpose	Development
NB	Air, Land and Water: Reporting to New Brunswickers on Environmental Progress	2003	Issue-specific report 2008	PDF	-	-	-	-	-
NS	Indicators of Prosperity 2012	2012	2011 Issue-specific reports 2008-2009	PDF	Policy-oriented approach with capital based approach	Environment, economy and society	16 indicators	None provided	Inter-departmental working group
PEI	State of Environment Report 2010	2010	2003 Issue-specific report 2002	PDF	Theme-based approach	Environment	35 indicators	"...to establish periodic, objective reporting on the health of the environment that will give governments, organizations, businesses and individuals a picture of where we stand managing and protecting our environment."	Department of Environment, Energy and Forestry
NL	No report	-	-	-	-	-	-	-	-

P/T/F	Title of most recent report	Date of last report	Previous reports	Format	Framework	Scope	Indicators	Purpose	Development
YT	Yukon State of the Environment Interim Report: An Update for Environmental Indicators	2013	2008 2007 2006 2005 2004 2003 2002 2001 2000 Issue-specific report 2010	PDF	Theme-based approach	Environment	22 indicators	"... a. to provide early warning and analysis of potential problems for the environment; b. to allow the public to monitor the progress toward the achievement of the objectives of this Act; and c. to provide baseline information for environmental planning, assessment and regulation."	Environment Yukon, with contributions from Energy, Mines and Resources and Community Services, as well as the City of Whitehorse, Environment Canada, and the Yukon Land Use Planning Council
NWT	NWT State of the Environment Report	2012 (update)	2009 Issue-specific report 2003, 2010	Online	DPSIR adaptation	Environment	69 indicators	"... to provide information about our changing environment to identify trends and help make decisions so NWT residents can continue to enjoy clean air and productive forests, land, waters and wildlife."	Department of Environment and Natural Resources with input from various agencies and others.
NU	No report	-	-	-	-	-	-	-	-

P/T/F	Title of most recent report	Date of last report	Previous reports	Format	Framework	Scope	Indicators	Purpose	Development
CAN	Canadian Environmental Sustainability Indicators	2013 (update)	-	Online	Policy-oriented with theme-based approach	Environment	54 indicators	"... to measure the progress of the Federal Sustainable Development Strategy, to report to Canadians on the state of the environment, and to describe Canada's progress on key environmental sustainability issues."	Environment Canada with the support of other federal government departments, such as Health Canada, Statistics Canada, Natural Resources Canada, Agriculture and Agri-Food Canada, as well as provincial and territorial government departments

4.1. British Columbia

British Columbia recently launched an environmental sustainability monitoring website, called Environmental Reporting BC (British Columbia Ministry of Environment, 2013). This online report is a departure in reporting practices in BC. The previous report, *Environmental Trends in British Columbia: 2007*, was the fourth in a series of Environmental Trends reports from the Ministry of Environment that began in 1998 (British Columbia Ministry of Environment, 2007). These reports were comprehensive, technical PDF reports, featuring a large amount of information, whereas the Environmental Reporting BC website features a smaller set of indicators with basic data and analysis and links to other websites and reports for more detailed data and information.

The website is developed and hosted by the Ministry of Environment. The principles for reporting identified by the Ministry of Environment are that the report should be based on best available data, information, and knowledge; based on rigorous scientific investigation; includes consideration of community, social and traditional knowledge, and; utilizes leading edge science communication practices. One of the goals of reporting, as identified by the Ministry, is to provide the basis for informed decision making so that individuals, agencies and policy-makers can take positive action.

The Ministry of the Environment employs an adaptation of the DPSIR framework for reporting on environmental sustainability. However, unlike the 2007 report where each indicator is identified as a pressure, state/condition, impact, or response, the individual indicators are no longer classified by this framework. The “About Environment Reporting” includes a description of what an environmental indicator is, a description of the DPSIR framework and the criteria used in indicator selection. The criteria for indicator selection are:

1. Scientifically credible and accepted by experts, stakeholders and end users;
Relatively simple and cost effective;
2. Representative of key issues and broader impacts or effects; Responsive to changes within a useful reporting time scale;

3. Useful for prediction;
4. Relevant to needs of policy-makers or enables individuals to make meaningful decisions;
5. Compatible with other indicators to present an overall picture;
6. Readily communicable, interesting, clear and easy to understand.

The “About Environment Reporting” page features links to other reporting programs including international state of environment reporting programs (e.g. United Nations SOE Gateway), Canadian Environmental Indicator Reporting Programs (e.g. CESI and the Canadian Biodiversity: Ecosystem Status and Trends report (2010)), other BC Indicator programs (e.g. BC Stats – Environmental Statistics), and examples of municipal or regional reporting programs in BC (e.g. Vancouver Sustainable Region Initiative).

The indicators are presented using a thematic approach, with nine indicator topics: air, climate change, contaminants, land, marine, plants and animals, sustainability, waste, and water. There are between one and seven indicators per topic. The webpage for each topic lists the indicators with links to indicator pages and the month/year of the last update. The topic pages also feature a list of related links. For instance, on the webpage for contaminants there are links to the BC Environmental Protection website and the CEPA Environmental Registry monitoring programs website. The water topic page links to several programs including BC’s water resources atlas, BC’s Water Plan, Groundwater Observation Well Network Portal, Real-time Water Level and Stream Flow (Hydrometric) Data, CESI water indicators, and Environment Canada freshwater quality monitoring and data.

Environmental Reporting BC (British Columbia Ministry of Environment, 2013) features 35 indicators. Each indicator has its own webpage and indicators are presented in a variety of formats. Compared to previous reporting practices, the online report features links to other programs and sources of data, instead of providing comprehensive information alongside the indicator presentation. Most indicators have not been updated since the 2007 report and are presented using a simple statement of the findings such as “Average water use per person has been decreasing in B.C.”, a figure depicting the data and a few bullet points describing or contextualizing the data. At the time of this study, none of the indicators under the climate change, sustainability,

marine and contaminants topics have been updated since 2007 and the data is considerably out of date in some cases. For example, the indicators on the proportion of coastal population served by municipal wastewater treatment, changes in the Agricultural Land Reserve, and population density and distribution haven't been updated since 1999, 2000, and 2001, respectively.

The eight indicators that have been updated since 2007 are presented using interactive charts, infographics, background information and analysis. Air quality for example is presented using a colourful infographic with information on what is measured, the major sources of fine particulate matter (PM_{2.5}) emissions, how the measurement methods have changed and how Vancouver compares to other Canadian cities. While this is the only indicator presented under the air topic, the webpage also includes links to more reports and data (e.g. the B.C. Lung Association State of Air Reports (2005-2012), real-time air quality health index readings for B.C., the CESI air indicator page and the B.C. air data archive).

Another example of a new indicator presentation approach used in the online report is the trends in ecosystem protection indicator. The indicator includes an animated chart that shows the growth in protected area by biogeoclimatic zones, between 1911-2012. The reader is able to manipulate the data in the graphic in several ways to show specific park data, the size of protected areas, and the size and percent of protected areas by biogeoclimatic zones. The data can be depicted as a bubble chart, line chart or bar graph. An infographic called "BC Parks: More than just a pretty place" is also used for this indicator, which describes the environmental, social and economic benefits associated with protected areas in BC.

Of the 35 indicators included in the report, approximately half (18) contain trend information, three feature inter-jurisdictional comparisons, and one includes a target. While the number of years of data presented varies, many include long term trends, such as trends in ecosystem protection through establishment of B.C. parks and protected areas (1911-2012), changes in the Agricultural Land Reserve in B.C. (1974-2000), grizzly bear mortality (1976-2011), and intensity of conventional energy use in economic activity in British Columbia (1981-2003). Municipal solid waste disposal includes a comparison with Japan (international leader in waste diversion) and Nova

Scotia (Canadian leader in waste diversion). Daily water use and fine particulate matter indicators also feature benchmarking. The only target reported against is the annual BC objective for fine particulate matter.

Environmental Reporting BC includes sufficient information to contribute positively to key objectives for environmental sustainability reporting: performance management, public education, and government transparency and accountability. While it is clear that at the time of this study the report is under development, the breadth of indicators provides a general indication of environmental sustainability performance in the province. Indicators such as fine particulate matter, long-term temperature and precipitation trends, municipal solid waste disposal, ecosystem protection, and species status provide readers with a general sense of sustainability progress. Interestingly, however, British Columbia is the only jurisdiction that does not include greenhouse gas emissions in its report (a link is provided on the climate change topic webpage). BC-specific indicators such as density of marine traffic along the BC coast, changes in the Agricultural Land Reserve, long-term deposition of pollutants in sediments on the coast, and trends in shellfish closures due to sewage contamination provide information on issues of importance to British Columbians.

Further, explicit linkages between policies and outcomes are evidence of reporting for performance management. For example, the indicators for Agricultural Land Reserve and long-term deposition of pollutants in sediments on the coast link performance outcomes to specific policy initiatives and controls. The report also contributes to government transparency by including numerous links to full data sets for many indicators. A section of the report entitled “Archive and Data” lists all of the indicators used in reporting between 1993-2007 and details which of the comprehensive reports (1992, 1998, 2000, 2002, 2006, 2007) carried each indicator, and on what page. Further, new approaches enable users to access data in new ways, potentially contributing to education and social participation. Of note, under the air quality theme a link to Air Quality Health Index iPhone app is provided. Compared to the 2007 report which contained 352 pages of text-heavy information, the Environmental Reporting BC website is more user friendly and accessible.

4.2. Alberta

According to section 15 of Alberta's *Environmental Protection and Enhancement Act (2000)*, Alberta's Minister of Environment is required to report annually on the state of Alberta's environment. Alberta began reporting on the state of the environment in 1994. The government has since moved the environmental sustainability reporting system online in order to allow for regular updating (Alberta Environment and Sustainable Resource Development, 2013). The Department of Environment and Sustainable Resource Development compiles, analyses and publishes the report. Several other departments contribute to the collection and analysis of the data, including Agriculture, Food & Rural Development; Tourism, Parks and Recreation; Energy; Sustainable Resource Development; and Energy Resources Conservation Board.

Alberta uses a variation of the DPSIR framework organized into themes. The indicators are categorized as condition, pressure, response or performance and grouped under the following four themes: air, water (which is subdivided into surface water and groundwater), land, and biodiversity. In total there are 40 indicators comprised of: 22 condition indicators, 9 pressure indicators, 6 response indicators, and 3 performance indicators. The types of indicators given under each theme vary considerably. For instance, land is the only theme that has performance indicators, such as percent of wildfires annually that are contained within the first burning period, and the biodiversity theme features only condition indicators, such as percentage of species at risk.

The introductory section of the website begins with a page describing the reporting approach taken by the province, followed by a page with background information on climate change including the greenhouse gas effect, anthropogenic sources of climate change, the expected impacts in Alberta and the importance of mitigation. The body of the report features webpages for each theme with background information on the issues, including sources of impacts, regional differences, effects on the environment and society, and links to related strategies and further information. The four themes are given on a side menu, where the reader can select from the condition, pressure, response or performance indicators under the theme (although not all are available under each theme). Each indicator is featured on a separate webpage.

At the top of the webpage for most indicators the date of the last update is given. Most indicators have been updated in 2011 and 2012, while a few were updated in 2013 and one was last updated in 2010. Each indicator is introduced under a subsection entitled “Why Is This Indicator Important?”, which explains what is being measured, and what the results tell us about what is happening in the environment.

The indicator data is presented using a graph, table, pie chart or map, followed by a section entitled “What does this indicator show?” This section often begins with a description of the trend, which is classified as improving, deteriorating, no clear trend, or mixed trends. If the trend is complex, it is described in more detail. For instance, for the Alberta River Flow Quantity Index, the trend is described as follows, “River flow in 2012 was normal for much of Alberta, with a few seasonal low or high flows observed. Impacted rivers show typical patterns resulting from regulation and diversion.” This section also highlights regional differences, cause-effect relationships, technical information associated with the measurement or monitoring program, and links to more in-depth analysis or technical reports. Regional differences or other characteristics of the indicator findings are highlighted and linkages between land uses in those regions and environmental outcomes are extrapolated. For instance, under the methane gas in groundwater indicator, differences between the isotopes found at sampling sites provide information on the impact of oil and gas development relative to naturally occurring methane. In some cases, direct linkages are made to policy initiatives, such as for the parks and protected areas indicator where the Special Place Program that ran between 1995 and 2001 is highlighted as the major initiative influencing the increasing trend in protected areas.

The next section, “What actions are being taken?”, describes the on-going monitoring programs, the relevant policy and program initiatives, inter-jurisdictional initiatives, and management plans, as well as activities undertaken by others such as NGOs, conservation authorities or other organizations. Often these sections feature links to additional information on the government of Alberta website or elsewhere, including access to historical datasets, such as those housed by the Clean Air Strategic Alliance. In general, the quality of information varies significantly in this subsection, from very high-level descriptions of on-going monitoring efforts to detailed information on specific

priorities, current management actions and their links to overarching management frameworks.

Most indicators contain trend information as well as descriptions of the changes and influences on the trend over time. However some indicators, such as the river water quality indices, contain no trend information. The longest trend information provided is given for the oil and gas wells reclamation indicator, from 1963-2011. The indicator for soil acidification in forested sites also provides significant historical information with data from 1981-2008. Few indicators, however, have targets and benchmarks. Alberta provides targets or goals for the Air Quality Index, progress towards meeting the Canada-Wide Standard for Particulate Matter and Ozone, wildfires, and species at risk. Several indicators give the Alberta results relative to the Canadian average, but only the solid waste diversion indicator has information on how Alberta ranks in relation to other provinces.

The report provides a variety of information that is specific to provincial and regional environmental sustainability concerns. Indicators focused on agricultural impacts such as the pesticide index, and others that measure impacts specific to the oil and gas industry, such as water used for oil injection purposes and methane gas in groundwater, reflect specific environmental pressures and societal concerns in the province. Indicators such as those on water quality, air emissions and waste recycling provide an indication of general progress towards sustainability.

As stated in the report introduction, some indicators were chosen to manage the cumulative effects of development on the environment, and provide information that could contribute to performance management. In addition, response indicators give important information on the effectiveness of actions taken by the government to reduce pressures on the environment. Alberta provides three performance indicators in its report: progress towards meeting the CCME Canada-Wide Standard for Particulate Matter and Ozone, natural area representation achieved by parks, and percent of wildfires annually that are contained within the first burning period. The report also features six response indicators under the land category: coal mining development and reclamation, hazardous waste recycling, oil and gas wells reclamation, oil sands mining development and reclamation, solid waste diversion, and timber harvest versus

allowable cut. The oil sands mining and reclamation indicator for example tracks how well government policies are working to ensure that land is reclaimed in a timely manner following oil sands development. There are no response indicators for air, water and biodiversity and no performance indicators for water and biodiversity.

The report also provides information on environmental sustainability in the province that could contribute to public education. The use of indicators such as the Air Quality Index and the water quality and quantity indices provide important information to residents and stakeholders. While the report is focused primarily on the presentation of indicator findings, it does feature some supplementary information on topics that may be of interest to readers. There are three instances of supplementary information in the report: background information on ambient air quality monitoring, soil pH, and the reclamation process and reporting requirements. Finally, the online, up to date and hierarchical presentation of the indicators as well as the abundance of active links enables users to access information that is of interest to them, at the appropriate level of detail, without looking through the rest of the content.

4.3. Saskatchewan

Saskatchewan's *State of the Environment Report Act* (1990) mandates that the government prepare a provincial State of the Environment report every two years. The most recent report, *Saskatchewan's 2013 State of the Environment Report*, is the province's twelfth provincial assessment of the health of the environment, published by the Ministry of the Environment. Over the past two decades, the government's approach to reporting on environmental sustainability has evolved over time. The first province-wide report in 1991 was followed by four regional reports from 1995-2001 highlighting environmental trends by ecozone. Another province-wide State of the Environment report was published in 2005, followed by a watershed report in 2007, and a report on provincial forests in 2009. The province-wide 2011 report introduced the framework that has continued through to the 2013 report. The government notes, however, in the 2013 report's conclusion that "state of the environment reporting will continue to evolve in response to changing environmental priorities and public concerns, and a drive for continuous improvement in reporting" (Saskatchewan, 2013, p. 69).

The framework for the 2013 report uses an adaptation of the DPSIR framework as well as the theme-based approach. The adaptation of the DPSIR framework used is the 'Condition-Stressor-Response' model. Each environmental sustainability indicator is categorized in this way as well as being grouped into one of five environmental themes: Air, Climate, Land, Forest, and Water. Three indicators are used under each of the Air and Water themes, Climate has one indicator, and Land and Forest each have five. In all, 17 key indicators are used. The indicators were chosen from a review of past reports and for their ability to provide a representation of currently available information, relevant and accurate data sets and long-term trend information.

The report opens with a message from the Minister of Environment, followed by and “SOE by the numbers” section that feature a graphic summary of highlights from the report grouped into condition, stressor and response indicators. The report features an introductory section including the government’s legislated reporting mandate, a list of previous reports, the background and purpose of the 2013 report and the reporting framework used. The stated purpose of the report is “to raise awareness and understanding of the environment, identify emerging issues and trends, and to highlight the actions needed by the public, First Nations and Métis, industry, business, government and non-government organizations to improve the way we use, manage and balance the environment with a growing and dynamic resource economy” (Saskatchewan, 2013, p. 5).

Each theme begins with a few short list of findings, followed with introductory and background information. The indicators are presented as condition, stressor or response and their importance to environmental sustainability in Saskatchewan is described. Table 3 gives examples of indicators from each category used in the report. The findings are presented in tables, maps and figures and the results are explained, often offering insights into regional difference, sector-based information or other details.

Table 4.2. Selected indicators from Saskatchewan’s 2013 State of the Environment Report

Category	Example Indicators
Stressor	Mineral Disposition Activity Forest Insect and Disease Disturbance
Condition	Air Pollutant Concentration Forest Type and Age Class
Response	Forest Regeneration Private Land Stewardships

Most indicators have trend information but none has performance targets or detailed benchmarking. The indicator with the most historical data is Area of Land Under Summerfallow, which includes data from 1916 to 2012. The only indicator without trend information is the Forest Type and Age Class indicator. The report does not feature any targets or detailed benchmark information, other than the intrinsic performance information in some indicators such as the Air Quality Index (Very Poor, Poor, Fair, Good and Excellent), the Water Quality Index (Impacted, Stressed, Healthy), and the Surface Water Quantity index (Low, Moderate and High Intensity). Saskatchewan’s performance is described in text relative to other provinces such as “The province accounts for 10.4 per cent of Canada’s total GHGs with three per cent of the country’s population”, and “Saskatchewan has the highest rate of return of all deposit-paid beverage container programs of any province.”

The report features information at multiple scales. Many indicators are represented on a map of Saskatchewan, broken down by region or watershed, which offers region-specific information and highlights regional differences. For example, a map from the land section of the report shows the number of water conservation stewards by watershed. There are also several Saskatchewan specific indicators used, particularly concerning agricultural land, such as Land Cover Type on Saskatchewan Farmland, and Area of Land under Zero-Tillage. General indicators are also featured that give a broad understanding of sustainability in Saskatchewan, such as the Air Quality Index, Water Quality Index, GHG emission, Criteria Air Contaminant emissions, and recycling.

Following the presentation of indicator findings, a section called “What actions are being taken?” provides information on relevant legislation and regulatory tools that are being used or developed, the monitoring regime, initiatives, plans, resources for information as well as inter-jurisdictional efforts. The authors highlight many of the relevant efforts to coordinate on key inter-jurisdictional issues including Saskatchewan’s participation in national working groups, inter-provincial MoUs, and programs that support national initiatives such as Saskatchewan’s air zone management, which supports the new Canada-wide Air Quality Management System (AQMS) developed through the CCME.

At the end of each theme, the authors include a short section that highlights local responses to environmental challenges. This “snapshot of local responses” section features initiatives such as the Regina Air Quality Monitoring Study, a bioenergy wood pellet project, Climate Change and the Island Forests in Central Saskatchewan, Saskatchewan's Deep Saline CO₂ Storage Research Project, and Native Plants in the Classroom

The Saskatchewan’s 2013 State of the Environment Report contains information that supports performance management such as performance indicators and descriptions of priority setting based on findings. Some indicators, such as waste recycling and forest regeneration show the effectiveness of policy interventions, and indicators such as air zone management areas and area under zero till are a direct measure of a particular policy approach. These indicators in fact don’t measure the state of the environment (in this case, the environmental measures might be ambient air quality and organic matter content of soils) but instead the degree of implementation of the policy. The authors link the state of environment reporting to performance management, stating that “As the Ministry of Environment moves forward in using a results-based regulatory approach, the information in this report will be used to help set future priorities in measuring the health of key components of the environment.” (Saskatchewan, 2013, p. 3)

The report also contains sufficient information to contribute positively to government accountability and public education. The report details the activities of the government on priority initiatives such as the province’s results-based regulatory reform,

the Saskatchewan Environmental Code, CCMEs Air Quality Management System, and the Boreal Watershed Management Strategy. The background information provided for each theme and indicator and the links to resources for local information provided after each theme give the reader access to important information on each issue. The “SOE by the numbers” section at the beginning of the report gives a full overview of the findings and trends using a graphic layout. Overall the report is concise, informative and easy to navigate. The Ministry is currently considering developing on-line state of the environment reporting system in order to facilitate continuous updating.

4.4. Manitoba

The *2009 Provincial Sustainability Report for Manitoba* is the second sustainability report published by the government of Manitoba, as required under part 5 (sections 9(1) to 10(4)) of *The Sustainable Development Act* (1997). This report is a collaborative effort across all government departments, and indicators were chosen based on recommendations from the Manitoba Round Table for Sustainable Development. The indicators “are intended to be useful supplements to the more traditional measures which our society has typically used, and allow Manitobans a more holistic picture of our society” (Manitoba, 2009, p. 7). The stated purpose of the report is to “provide Manitobans with timely, accurate information on important sustainability issues and trends.” (p. 2). The approach for the 2009 report builds on the indicator framework established in the original 2005 sustainability report in order to extend the trend information provided in the first report. The government’s intention is to continue to use the same framework in subsequent reports as well, which are released every five years, as required by *The Sustainable Development Act* (1997).

The 2009 report is divided into 5 chapters: the first three make up the indicator-based reporting and the last two provide information and updates on two important government initiatives – sustainable land use planning and sustainable development procurement. The first three chapters are divided according to the three “pillars” of sustainability – the natural environment, the economy, and social well-being. This integrated reporting approach allows the government to report across many wide-ranging issues and initiatives while highlighting the inter-relationships that exist between

them. Each chapter breaks the given dimension of sustainability into several themes. The chapter on the natural environment features six sections: biodiversity and habitat conservation, fish, forests, air, water, and climate change. Throughout the report each section contains between one and four indicators, combining for a total of 45 indicators in all.

The report begins with a message from the Minister of Conservation, an executive summary and a comprehensive summary of key findings and trends from the indicators in the report, broken down by chapter. The summary gives background on each chapter along with a table of the indicators for that chapter and their overall trends (stable, changing, variable, inconclusive, positive or negative). An introduction to the report follows the summaries and describes the legislative requirement for reporting, the report's purpose and development and a profile of the province including ecological, social and economic information to orient readers.

Each theme begins with a section called "Why is it important?" that describes the value of the resource or issue in the context of Manitoba. For instance, the section on water begins with "Manitoba's lakes, rivers and streams are crucial to Manitoba's economic prosperity and the health and well-being of our residents. We depend on water for almost every aspect of our lives, including hydroelectricity, fishing, agriculture and industrial uses, drinking, recreation, bathing and more. Hundreds of millions of dollars are generated each year as a direct result of our fresh water supply" (p. 29). The indicators under each theme are then listed and their trend is described as stable, variable, positive, negative or inconclusive.

For each indicator, background information is given to provide context for the findings. This information includes key issues, key definitions and aspects of the environment, historical use patterns, the monitoring program, relevant legislation, plans, initiatives, and statistics. Often the intent is given, such as for the indicator of forest type and age class, which states, "the intent of tracking this indicator is to ensure that natural disturbance events and various forests uses do not reduce forest diversity" (p. 20). The data are presented in line graphs, pie charts, maps, and tables, depending on the indicator. The trend is described and some interpretation is given, particularly in relation to deviations from expected findings. Often, the causes and drivers of the indicator

trends are described along with the presentation of findings. For instance, for the energy intensity indicator the authors explain that the 30 per cent overall reduction in energy intensity from 1982 to 2001, can be explained by energy efficiency and market transformation efforts such as LED lighting, high efficiency furnaces, building code improvements, displacement of natural gas with electrical energy, and improved processing efficiencies in the industrial sector.

Depending on the theme, different sub-sections may be used to present more information on the subject, such as “Implications for sustainability”, “For more information” which features links to government websites, and “Recent actions” which includes detailed information on on-going initiatives. Under “Implications for sustainability”, an interpretive discussion of the findings includes descriptions of cumulative effects, gaps in knowledge, key pressures on the resource, monitoring information, collaborative approaches (inter-jurisdictional), and forecasted changes (i.e. climate change). The “Recent actions” subsections feature information on strategies, active councils, programs, initiatives, and management plans. The “For more information” sections list websites developed by government and other organizations.

Direct indicators of environmental sustainability are primarily found under the natural environment and economy chapters of the report. Many indicators indirectly related to environmental sustainability are also included in the economy and social well-being chapters (see table 4). For all indicators, the sections on “Why is this important?” and “Implications for sustainability” provide linkages to the other dimensions of sustainability and highlight the interconnectedness between issues. In some cases though, the descriptor used to describe the trend does not consider the indirect effects on other dimensions of sustainability. For instance, growth in population and mineral exploration are described as positive under social well-being and economy, respectively. However, these could also be considered indirect indicators of negative pressures on the environment. This illustrates a difficulty inherent in integrated reporting, where trade-offs between different types of capital are sometimes implicit.

Table 4.3. Examples of Environmental Sustainability Indicators featured under each chapter of the 2009 Provincial Sustainability Report for Manitoba

Chapters	Selected Environmental Sustainability Indicators (and their trends)
Natural Environment	Water quality WQI by ecozone (stable) Total annual and seasonal precipitation (inconclusive) Commercial fish harvest (variable)
Economy	Adoption of sustainable agricultural management practices (positive) Mineral exploration (positive) Waste disposal (negative)
Social Well-being	Progress towards debt repayment (positive) Voting rates (positive) Income inequality (positive)

Most indicators used by Manitoba are general in nature and, when taken together, give a broad overview of progress towards environmental sustainability in the province. These include GHG emissions, air quality, energy intensity, waste recycling, and protected areas. Some indicators, such as water allocation by stream type, ecosystems at risk, and water quality by ecozone, are presented with regional and local data. Local information is also highlighted using the text boxes throughout the report. For example, a text box in the climate change section describes Manitoba's Community-Led Emissions Reduction Program – a program to provide tools, resources, education and incentives to assist local governments, businesses, community organizations and local residents to reduce their greenhouse gas emissions and make more sustainable decisions. A few indicators, such as adoption of sustainable agricultural management practices and fish species biodiversity and population, are very specific to Saskatchewan and reflect the Saskatchewan economy and concerns of its citizens.

Manitoba provides trend information for most indicators, but only one target and two benchmarks are provided. The target included in the report is the GHG emissions target, which is described in text. The GHG emissions indicator also features a graph that shows Manitoba's performance relative to the provinces and territories. The renewable energy and waste disposal indicators describe Manitoba's performance relative to other provinces and the national average in the text.

By providing a general overview of environmental sustainability in Manitoba, the report contains information to contribute to public education and performance management. The intention to inform the public is reflected in the minister's message, which opens the report and states "I am confident that readers and users [...] will be better informed and better able to make the kind of decisions that will contribute to a greener, fairer future for all Manitobans" (p. 1). The report is primarily focused on the presentation of indicator findings, however it does feature some supplementary information on other important sustainability issues. Chapter 4 of the report on land use planning describes the current land use planning, future changes to focus on community-level planning, and legislative changes to preserve traditional land use areas for Aboriginal peoples. In terms of reporting as a tool for performance management, some indicators presented reflect the effectiveness of government interventions to reduce negative pressures on the environment, such as forest renewal and adoption of sustainable agricultural practices, and linkages are often made between performance and policy.

4.5. Quebec

Quebec established its first set of sustainable development indicators in 2009. The indicators were developed as part of the final stage of implementation of the 2004 Quebec Sustainable Development Plan, which also led to the *Sustainable Development Act* (2006), and the Government Sustainable Development Strategy 2008-2013 in 2007. The indicators were developed primarily by the Ministère du Développement durable, de l'Environnement et des Parcs (MDDEP) in collaboration with the Institut de la statistique du Québec (ISQ).

The stated purpose of Quebec's sustainable development indicator system is "to aid in decision - making and the revision of sustainable development policies or strategies by the authorities that put them in place; to inform citizens (educational and motivational function); to measure observable progress or setbacks (evaluation); [and] to compare Québec with other states." (Quebec, 2010. p. 5)

The government developed three levels of indicators to monitor progress towards sustainability in Quebec:

- Sustainable development indicators,
- Indicators for monitoring objectives of the government's sustainable development strategy, and
- Indicators for monitoring sustainable development actions of government departments and agencies.

Level 1 indicators measure general societal progress towards sustainable development. Level 2 indicators measure progress towards the objectives of the Sustainable Development Strategy as achieved through actions of the government and other sectors of society. The findings for these indicators are meant to inform the revision of the strategy every five years. Level 3 indicators measure the degree to which government departments and agencies achieve publically announced commitments. Table 5 illustrates how these three levels of indicators fit together (Adapted from Quebec, 2010). These three levels of indicators correspond to the levels of intervention represented by the *Sustainable Development Act*, the Sustainable Development Strategy and the sustainable development action plans produced by government department and agencies (Quebec, 2010). Level 1 and level 2 indicators are updated regularly and published on the website of the Institut de la statistique du Québec, while level 3 indicators are published in the progress reports on the implementation of the government's sustainable development strategy. Level 3 indicators for monitoring the sustainable development activities of departments and agencies are internally oriented and track departmental progress on their action plans under the *Sustainable Development Act*. Collectively, the departments have developed 1585 level 3 indicators, which are reported in their departmental reports. Departmental reports are outside of the scope of this study and therefore level 3 indicators were not included.

Table 4.4. Relationship between the three levels of reporting used in Québec's sustainable development indicator system.

Level and Type of Indicators	Number of indicators	Example of Indicator	Time frame
1. Indicators of Sustainable Development	20	Mean annual temperature trend	Many decades
2. Indicators for monitoring the Strategy	84	Reduction of GHG emissions	To identify adjustment needed in the next generation of the strategy (every five years)
3. Indicators for monitoring a sustainable development action plan	1585	Reduction of energy consumption for transportation	Annual or periodic basis

When choosing its indicator system, Quebec studied the systems developed by other countries and international organizations and decided to use the capital-based approach and the objectives-based approach (Quebec, 2010). The capital based approach is used for the level 1 indicators, while the objectives-based approach is used for level 2 and level 3.

The adoption of the capital based approach as the framework for measuring general progress on sustainable development in Quebec (level 1) drew heavily from the work of the international group of experts called the Working Group on Statistics for Sustainable Development (Quebec, 2010). Based on this work, Quebec measures five types of capital: human, social, produced, financial and natural. For each type of capital a small number of indicators is chosen to represent the different dimensions of the capital. For instance, for natural capital the dimensions are biodiversity, agricultural land, forests, surface water, air quality and climate. A negative or positive trend in the indicator(s) is presumed to represent the change in the stock of that dimension of the given capital. For each type of capital the number of indicators ranges from two (for produced and financial) to seven (for natural), with a total of 20 indicators. The government expects that the set of indicators could be improved or added to by the time of full implementation in 2015 (Quebec, 2010).

Some indicators featured under human, social, produced and financial capitals indirectly measure aspects of environmental sustainability. The human capital indicators

measure employment, health and education. The social capital indicators measure interpersonal networks, equality and culture. The produced capital indicators measure fixed capital and housing stocks and the financial capital indicators measure the assets of households and governments. The natural capital indicators are the only ones that directly measure environmental sustainability.

For the level 2 outcomes-based approach that measures the government's progress in implementing the sustainable development strategy, one or more indicators are given for each of the strategic objectives. When more than one indicator is used to measure a strategic objective, the indicators are designed to be complementary, with some indicators based on national and sectoral government objectives and others that are administrative indicators illustrating government performance (Quebec, 2010). There are 84 indicators for the strategy, organized under the nine directions and 29 objectives of Quebec's Sustainable Development Strategy 2008-2013. Table 6 gives an example of a corresponding direction, objective and indicator.

Table 4.5. Selected example of a level 2 indicator that correspond to a given objective and direction of Quebec's Sustainable Development Strategy 2008-2013.

Direction 6	Build and develop the country in a sustainable and integrated manner
Objective 18	Integrate sustainable development imperatives in strategies and management plans and regional and local development
Indicator	Cumulative financial assistance to municipalities to encourage and help them to reduce by 20% frequency of combine sewer overflows in heavy rains

For both the summary reports and the ISQ website, the information on each indicator is presented on a one or two page "fact sheet", that features five sections: background information, limitations of the data, figures, analysis, and the contribution of that indicator to the achievement of the dimension of capital (for level 1 indicators) or the contribution of the indicator to the achievement of the strategic outcome (for level 2 indicators).

For both level 1 and 2 indicators, these sections follow the same format. The background includes an explanation of what is being measured, a description of the issue, its importance for sustainability, key definitions and other relevant information

such as information on the monitoring regime and methodology, pertinent legislative, policy or process information, and linkages with environmental agreements or other commitments, depending on the indicator. For example, for the recovery and recycling of waste indicator, the description section includes definitions of residual material, recovery and valuation. Limitations of the data are usually given in the following subsection, including aspects not covered by the indicator, limitations of interpretation and changes to the statistical methodology. The data are presented in figures and maps, often with trend information and data by region. For level 2 however, some indicators do not feature a quantitative measurement of progress and instead give a summary of the work done to date, relative to a workplan, for an important program or initiative that contributes to the implementation of the strategy. For example, one of the indicators measuring objective 22 – protection and enhancement of heritage and natural resources in accordance with the carrying capacity of ecosystems – is progress towards the development of a methodology to assess cumulative impacts of water withdrawals. The findings are described in the analysis, which highlights regional variations and deviations from expected results.

The last section of the “fact sheet” differs between level 1 and 2 indicators. For level 1 indicators, the section features a description of the indicator’s contribution to the achievement of the given dimension of capital, the importance of the issue in relation to ecology, economy and society, the pressures that are being exerted on it and how the data will provide an indication of general progress of sustainable development. For example, for the indicator on territory of protected areas, the section states, “natural capital is directly dependent on the biodiversity that maintains the natural processes of ecosystems, as well as the goods and ecological service that they produce. (translated by the author) (Gouvernement du Québec, 2013a, p. 29, indicateur 14A).

For level 2 indicators, the information in this section is similar but it is tied directly to the achievement of objectives set out in the Sustainable Development Strategy or other relevant strategies, reflecting the outcomes-based approach at this level. The indicator is described relative to the objective and quotes from the Sustainable Development Strategy or another relevant government strategy are given to highlight the linkages between the indicator and the strategy. For example, the level 2 indicator measuring the number of programs adjusted to include criteria promoting responsible

practices, features the following quote from the Sustainable Development Strategy: “the state must lead by example and take into account the principles and objectives of sustainable development in its decisions. In this perspective, a way to encourage good practice is to secure public investment criteria of environmental protection and social responsibility.” (Gouvernement du Québec, 2013b, p. 33). This section also includes information on which type of capital the indicator contributes to, the issue’s importance for Quebec, and the associated impacts and initiatives. Often, the discussion is framed around reasons why progress on the issue is desirable, or why no progress in undesirable.

Both level 1 and level 2 indicators consistently feature trend and target information but few contain performance comparisons with other provinces or peer countries. The indicator with the longest running trend is mean annual temperature, which runs from 1961 to 2010. Some indicators such as representativeness of protected areas network and state of forest ecosystems give trend information by displaying maps of Quebec for two different time periods. Quebec does better than most other provinces in giving information on targets for indicators, and often presents the targets with the figures. For example, figure 1 taken from the level 2 report, shows the 2012 and 2020 targets for GHG emissions reductions. Most of the targets provided in the reports come from other strategies or policies, which are cited. This is the case for the targets for reductions in energy consumption of public buildings indicator from the Quebec Energy Strategy 2006-2015 and the 2006-2012 Action Plan on Climate Change, the recovery and recycling of waste indicators from Quebec Policy on Waste Management 1998-2008, and the territory of protected areas indicator from the Orientations stratégiques du Québec en matière d’aires protégées 2011-2015.

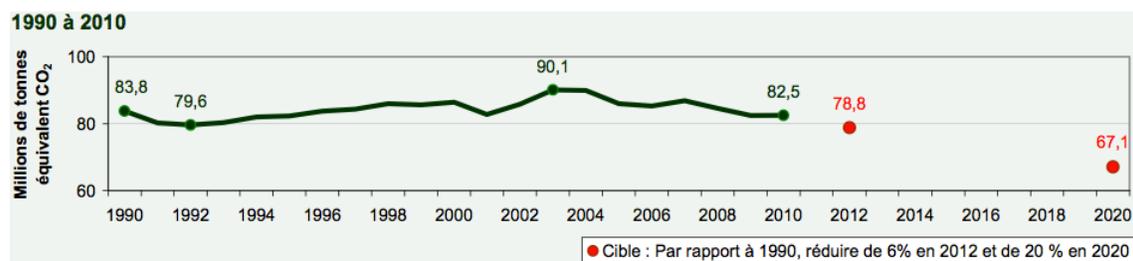


Figure 4.1. Figure from the level 2 report featuring Quebec’s 2012 and 2020 targets for GHG emissions reductions.

Both the Level 1 and Level 2 reports provide a mix of Quebec-specific indicators as well as general indicators reported on by many other jurisdictions. For level 1, most indicators are general and could be compared with other jurisdictions, such as territory of protected areas, air quality index, and agricultural area. Some level 1 indicators are more Quebec-specific such as state of forest ecosystems and water quality at the mouth of major southern watersheds, however most of the made-in-Quebec type indicators are level 2. There are several interesting level 2 indicators to choose as examples of jurisdiction-specific focus, such as number of rural laboratories started and complete, economic instruments introduced or enhanced to adopt environmental practices, and international initiatives to promote Quebec's approach to sustainable development.

It is clear that one of the objectives when designing the reporting framework for Quebec was performance management, reflected by the outcomes-based orientation of level 2 indicators. Indicators such as the number of programs adjusted to include eco-requirements or criteria promoting responsible practices, and number of economic instruments introduced or enhanced to adopt environmental practices, reflect administrative performance while use of public transit and final consumption of petroleum products, natural gas and electricity reflect progress in other sectors.

The use of a small suite of capital-based indicators (level 1) allows citizens to quickly assess and understand province-wide progress on sustainable development, potentially contributing to public education. However, the technical nature and presentation of some of the information may render it less accessible than the colourful, graphic reports from other provinces. Both level 1 and level 2 reports are singularly focused on reporting on the indicator findings and do not provide much additional information on sustainable development programs and initiatives of government and other sectors that may be of interest to readers.

Quebec's approach to monitoring and reporting on sustainable development provides sufficient information to contribute to government transparency and accountability. Firstly, the list of sustainable development indicators was subject to public hearings before the government adopted it. Furthermore, where appropriate, the indicators are directly linked to commitments and agreements made by the government. Both the ISQ and MDDEP websites provide links to the historical data sets and allow

users to create their own charts and tables. The MDDEP website also features two background documents on the development and conceptual framework created by the government when developing the indicators. Finally, at bottom of each indicator fact sheet, the date of the last update to the monitoring record, the last data update to the indicator and the expected time frame of the next data update are provided.

4.6. Nova Scotia

The government of Nova Scotia developed a set of indicators for reporting on progress towards sustainability as part of the implementation of the *Environmental Goals and Sustainable Prosperity Act* (EGSPA) in 2007. The indicators were first presented in the Environmental Goals and Sustainable Prosperity Annual Report (Nova Scotia, 2010a) along with a technical paper describing the approach and the indicators. The “Indicators of Prosperity” as they are called, have been reported in 2010, 2011, and 2012, along side the annual progress reports on the achievement of the goals of the EGSPA.

Developed by an inter-departmental working group, the indicators are directly linked to the implementation of the EGSPA, which contains time-bound goals. In particular, the indicators are intended to track provincial progress toward the EGSPA objective in section (1)(b), “to provide certainty to all sectors of the economy through the Government's economic development strategy [...] and establish clear environmental goals while improving the Province’s economic performance to a level that is equal to or above the Canadian average by the year 2020.” (Nova Scotia, 2010b p. ?). In the description of their development the writers refer to the indicators as “headline indicators”, reflecting their close link to policy.

In addition to being policy-oriented, the framework used by Nova Scotia is a capital-based approach, referred to as “domains”, based on the principle that “the health of the economy, the health of the environment and the health of the people are interconnected” (Nova Scotia, 2010b). In the context of EGSPA’s goals and objectives, economic performance is defined as a “measure of the Nova Scotia economy’s success in providing citizens with economic security, a healthy environment and social well-being, without compromising future generations” (Nova Scotia, 2010b, p. 5). Nova Scotia

chose five types of capital to use in their framework: natural capital (to measure a healthy environment), social capital, human capital (to measure social well-being), built capital, and financial capital (to measure economic security) (Nova Scotia, 2010b).

The indicators for each domain were selected using the following questions: What do we have? What is it producing for us? How well are resources used? Is it sustainable over time? The working group then screened the indicators based on the following criteria: readily available and updated periodically; easily compared to Canada and other provinces; able to show long-term trends; contain valid and reliable information; and, make sense to the general public (Nova Scotia, 2010b). In total, 16 indicators were selected. The government identified several challenges commonly met in the identification and selection of indicators, including quality of data and timeliness (Nova Scotia, 2010b). Interestingly, the working group also identified two challenges that reflect the specific approach taken by Nova Scotia. The first is that many potential indicators would be too complicated to effectively communicate to a layperson, reflecting the province's focus on accessibility of the information. Secondly, they identified that some possible indicators are too province specific, reflecting Nova Scotia's focus on inter-jurisdictional comparability. This second criterion reiterates the performance-based approach, as the intention of the indicators is to measure progress towards the EGSPA goal of "improving the Province's economic performance to a level that is equal to or above the Canadian average by the year 2020" (section 4(1)(b)), which is focused on performance relative to other jurisdictions.

The 2012 indicator report, *Indicators of Prosperity: Technical Report 2012*, opens with section 4(1) of the EGSPA. The introduction focuses on explaining what indicators are, how they are used and interpreted, the types of information that they provide to government and citizens, and the criteria used in the selection of indicators. The authors go on to discuss the shortfalls of traditional measures of prosperity such as GDP, and the need to develop broader indicators of environmental sustainable development and social well-being. The outcomes-orientation is highlighted using statements such as, "Indicators of success are chosen to measure the degree to which outcomes are achieved. Headline indicators provide broad benchmark data which can be used to judge the well-being of the Nova Scotia economy, and in reference to its place in Canada" (Nova Scotia, 2012, p. 2). The authors place Nova Scotia's sustainability

performance in the larger context of inter-jurisdictional issues and drivers that can impact conditions locally. Finally, the introduction concludes with a summary of the presentation format of the indicators.

The indicators are assigned a level of performance using the following four criteria: whether the level of performance is considered favourable, neutral or unfavourable; how the performance compares to the Canadian average; the performance rank out of ten provinces; and, the trend. The indicators are then assigned a rating based on these criteria. For ease of interpretation, a weather icon is used to represent each rating:

Table 4.6. Weather Icons

	Favorable level, high to middle Canadian ranking, overall positive trend
	Favorable to neutral level, middle to low Canadian ranking, flat or positive trend
	Neutral to unfavorable level, middle to low Canadian ranking, flat or negative trend
	Unfavorable level, low Canadian ranking, flat or negative trend

As per the capital-based approach, the indicators cover the economic, social and environmental domains of sustainability. The economic indicators are labour productivity, net investment in capital stock, GDP, government debt, personal savings, and consumer spending. The social indicators are persistence in low income, income equality, sense of belonging to local community, post-secondary education, life expectancy, and employment rates for visible minorities. The environmental indicators are value of natural resources, value of renewable resources (only timber), electricity generated from fossil fuels, and energy productivity.

Each indicator is presented using a descriptive table and a quantitative figure. The table contains eight rows of information: Indicator; Source of data; Description of data; Most recent data; Data availability (e.g. Annual and for all provinces); Rationale for selection; What it tells us; and Performance. The first five sections give the basic information on the indicator. The rationale for selection describes what makes the

indicator interesting to Nova Scotians, how the indicator relates to important issues in Nova Scotia and what the implications of its performance are. For example, the rationale for the selection of the electricity generated from fossil fuels indicator is that “Electricity generation represents an unusually high portion of total per capital fossil fuel usage in Nova Scotia compared to most other provinces. Monitoring this indicator will capture the impact of efforts to develop renewable sources of energy for electrical generation and improve efficiency of energy use.” (Nova Scotia, 2012, p.19). The ‘what it tells us’ section describes the direction of the general trend in performance and ranking. For instance, for the value of renewable resources indicator, this section states, “From 1995-2009, all provinces have been on the decline. Nova Scotia’s rate of decline is 3rd best (at -20.5%) out of nine provinces. Alberta’s has declined 35.7%” (Nova Scotia, 2012, p. 18). Finally, the performance sections present the overall rank for the indicator using the weather icon, and then describe how the indicator performs based on the level, rank and trend. The level is described using the quantitative findings, or relative performance (e.g. slower rate of decline than most of the country). The rank is usually based on all Canadian provinces but sometimes only features the four Atlantic provinces. The trend describes the change in performance or rank over time. The quantitative figure included for each indicator is a line or bar chart that shows the performance over time for all the provinces and Canada.

Nova Scotia’s ‘Indicators of Prosperity’ provides trends, and performance context through inter-jurisdictional benchmarking for almost all indicators. All indicators except one have a trend, with most covering between 5 to 15 years of data. Four indicators feature the longest running trends, for which data go back to 1996. The EGSPA provides the targets for performance as “a level that is equal to or above the Canadian average” (EGSPA, section 4(1)(b)). For all indicators, the performance of other provinces and the Canadian average are presented alongside the findings for Nova Scotia, and Nova Scotia’s rank relative to the other provinces and Canada is described in the performance section.

Nova Scotia chose a set of indicators that are general, facilitating inter-jurisdictional ranking and general sustainability progress monitoring. This approach allows for an easy to understand snapshot of sustainability in the province and gives context to Nova Scotia’s performance relative to its peers. However, the reports do not

include many indicators that reflect the specific values and circumstances for sustainability in Nova Scotia. The environmental sustainability indicators used are solely focused on natural resource use and don't reflect other values that Nova Scotians have with regard to the environment, such as water quality, air quality, biodiversity, etc. For instance, while the indicator of the value of natural resources allows for inter-jurisdictional comparison, it doesn't provide as in-depth information on Nova Scotia or on the change of endowment over time, as it does for other natural resource rich provinces like Alberta. Another trade-off in this reporting approach is that the report does not provide information on strategies, initiatives and policies of the government that effect performance in these areas.

4.7. Prince Edward Island

Prince Edward Island's *State of Environment Report 2010* is the second state of the environment report published by the province, and follows the same format and structure as the first one published in 2003. The report is developed by the Department of Environment, Energy and Forestry, with the stated purpose to "establish periodic, objective reporting on the health of the environment that will give governments, organizations, businesses and individuals a picture of where we stand managing and protecting our environment" (p. 3).

The reporting framework can be considered a theme-based approach, described in the report as being grouped by resources and other categories. There are eleven themes: drinking water, surface water, climate change, energy use, air quality, biodiversity, pesticides, waste management, environmental stewardship, soil quality, and land use. Each theme has between one and five indicators, for a total of 35 indicators.

The report begins with a message from the Premier and a message from the Minister of Environment, Energy and Forestry, both emphasizing the importance of reporting on the state of the environment in order to inform Islanders and facilitate informed decision-making and stewardship. The introduction to the report gives the purpose of the report, the importance of collective environmental stewardship (especially because 90% of land in PEI is privately held), and highlights areas where government initiatives have made significant progress, such as important partnerships, regulations,

new directions, and programs. The section on “Roles and Responsibilities in Environmental Stewardship” describes the present situation and what can be expected. These subsections – the present situation and what can be expected – are carried throughout the report for each theme. A section with highlights from each theme introduces the readers to why the theme is important, general findings from the report and relevant government initiatives.

Following this general introduction, the indicators are introduced. A section describes what indicators are and links indicators to decision-making, stating, “indicators provide a baseline of information which will allow us to judge whether decisions need to be reassessed” (p. 11). The list of the indicator criteria used by the Department of Environment, Energy and Forestry when selecting indicators is presented. A section on using the report follows and describes how the information is organized, what types of information are presented, and how to access the sources of data. This section explains limitations of data, use of proxy indicators and encourages feedback from readers to find better ways to assess the environmental impacts of choices and actions. The introductory section ends with a list of all the indicators used under each theme.

For the body of the report, each theme is introduced with a description of the present situation and what can be expected. This section features information on the current state of the resource, trends, impacts, pressures, common and emerging issues, recent reports, regulations, steering committees, etc. For example, the ‘present situation’ section for the surface water theme discusses erosion impacts, control measures, nutrient excess, and bacterial contamination. For the biodiversity theme, this section gives background information on the influence of past land use, stating “the province’s long history of settlement and land clearing has resulted in the loss of natural biodiversity at all levels” (p. 46). In the ‘what can be expected’ sections, government efforts and investments are explained and, when applicable, a warning is given as to the possibility of potentially worsening situations. For instance, under the surface water theme the authors state, “algal blooms, and the subsequent anoxia that follows, will continue to worsen if nutrient enrichment in the catchment basin increases” (p. 21).

Under each theme, the indicators are described in seven sections: description, importance, objective, interpretation, status and trends, response, and data sources. The

description is a brief statement of what is being measured, sometimes including definitions or explanations, for instance what is an “anoxic event”. The importance section puts the indicator into the broader context of sustainable development in PEI, including information on relevant impacts, sources of emissions/pollution, and the benefits of the desired state. For each indicator an objective is provided, giving the reader the opportunity to evaluate progress relative to the government’s objective for that issue as well as being given the opportunity to consider whether the objective is appropriate. Some objectives are specific time-bound targets, some are vague and others are ambitious targets. Table 7 gives an example for each of these types of objectives from the report. The status and trends section gives a presentation of the indicator data in a table, figure, or map. For some indicators, such as community watershed planning, the findings are described in text.

Table 4.7. Selected examples of different types of performance objectives found in the PEI 2010 State of the Environment Report.

Type of Objective	Indicator	Example of Stated Objective
Specific Target	Nitrate in Private Well Water	To have an average nitrate concentration of 3 mg/L or less (province-wide) and no wells exceeding the maximum 10 mg/L guideline recommended by the Guidelines for Canadian Drinking Water Quality.
Vague objective	Pesticide Occurrence in Groundwater	To minimize the presence of pesticides in groundwater, and to ensure that where detected, pesticide concentrations remain at concentrations which are not detrimental to human health.
Reach target	<i>Escherichia coli</i> (<i>E. coli</i>) in Private Wells	To have no wells testing positive for <i>E. coli</i> .

The interpretation section provides the description of the findings and the implications for the resource. Information here includes principle causes and drivers, trends, explications of anomalies, regional influences, and the role of climate. For instance, one of the interpretations of the findings for the nitrate concentration in surface water indicators is that “the nitrate concentrations recorded correspond closely with the acreage of cleared land in each watershed and the acreage under row crop production” (p. 24). The response section describes the relevant actions taken by government and others to address the issue. This includes things like government initiatives, programs,

legislation, investments, agreements, the basis for the objective, research projects, changes to the monitoring regime, etc. Due to the large proportion of private land ownership in PEI, this section sometimes emphasizes the limitations on the role of government and calls on private stewardship, such as for the nitrate concentration in surface water indicator, where this section states “For these trends to be slowed or reversed, the majority of landowners must accept nutrient management techniques as a necessary and viable production practice” (p. 25). Finally, the data sources are listed often simply by giving the name of the department or agency responsible for the data.

The Prince Edward Island *2010 State of Environment Report* features trend information for all but one of the indicators. The longest trend given is for sea level in Charlottetown, which has been monitored since 1911. The shortest trend given is for the number of species in PEI, which has data for 2003 and 2007. While all of the indicators feature some sort of objective, not all of them have a quantitative performance target. Many of the targets featured in the report come from inter-jurisdictional environmental agreements entered into by PEI such as the target for GHG emissions from Resolution 31-1 of the New England Governors/Eastern Canadian Premiers (75 to 85 per cent below 2001 levels by 2050), and the current Canadian Water Quality Guideline for the Protection of Aquatic Life. Examples of made-in-PEI targets featured in the report include adding 7,000 hectares of row cropped land under engineered soil conservation structures by 2014 (for the soil conservation management structures indicator), and to have a minimum target of 2,500 organically managed hectares and 60 farmers involved in organic production by 2010 (for the organic agriculture indicator). The only benchmarks provided in the report are when PEI is described as a “Canadian leader in diversion of solid waste” (p. 57) and GHG emissions are compared to total emissions in Canada.

The theme-based indicator approach used by PEI incorporates indicators that provide information of specific interest to Islanders, as well as general indicators allowing citizens and government to track broad progress towards environmental sustainability. Indicators that reflect the specific interest of the province and its citizens include shellfish closures, siltation of watercourse and wetlands, wood burned for residential heating, home heat oil tank compliance, and frequency of row crops. In fact, the importance of providing this type of tailored information is reflected by the siltation of watercourse and

wetlands indicator, which is of grave concern to Islanders but for which an “accurate measuring tool has yet to be found” (p. 30). Regardless of a lack of measurement tool, the general observed trend, ecological importance and major causes are described. General environmental sustainability indicators included are GHG emissions, rise in sea level, household electrical use, gasoline consumption, particulate matter and ozone concentrations, and protected land area.

The report features some information that reflects performance management. An example of where this information is provided is for the fish kills indicator, where the response section states “phasing out the use of [azinphos-methyl], coupled with improved watercourse buffer zones and other on-farm land management practices, have contributed to the decrease in fish kills in recent years” (p. 54).

The importance of private stewardship in PEI is a message that runs throughout the report and attempts to engage readers in the ownership of environmental outcomes. The breadth of indicators tailored to PEI, the introductory section to each theme and the information on the causes and impacts of human behaviours described for most indicators provide sufficient information to contribute positively to public education. Furthermore, indicators used to measure environmental stewardship in PEI, such as the number of holistic community watershed plans in Prince Edward Island, and participation in angling, hunting and trapping, reflect this focus on fostering public stewardship and engagement. In fact the authors state that the latter was chosen because, “as eyes and ears in the field, anglers, hunters and trappers are often the first to see and take action on issues and are important environmental stewards.” (p. 64).

Finally, two aspects of the report feature information that contributes to accountability and transparency. First, an appendix to the report features a list of all the legislation, policy and program initiatives undertaken between 2003-2010 that have implications for environmental sustainability. Second, a feedback form with active fields and a page for taking notes are provided at the end of the report where readers are encouraged to provide feedback on the ease of use, the level of detail, the relevance of the indicators, suggested improvements, and specific actions that should be taken as a result of the findings.

4.8. Yukon Territory

The Yukon *Environment Act* (2002) mandates the government to report publicly on the state of the environment every three years (s.48(1)) and to prepare interim reports for each year where a full report is not published (s.50(1)). The government published a report (interim or full) every year between 1997 and 2008. Since 2008, the government has published an interim report in 2012 and another in 2013, which is described in this section.

As described in the *Environment Act*, the purpose of the state of the environment report is “(a) to provide early warning and analysis of potential problems for the environment; (b) to allow the public to monitor progress toward the achievement of the objectives of this Act; and (c) to provide baseline information for environmental planning, assessment, and regulation.” (R.S.Y. 2002, part 2, s.47(2)). The report “shall (a) present baseline information on the environment; (b) incorporate the traditional knowledge of Yukon First Nation members as it relates to the environment; (c) establish indicators of impairment of or improvement to the environment and identify and present analyses of trends or changes in the indicators; and (d) identify emerging problems for the environment, especially those involving long-term and cumulative effects.” (R.S.Y. 2002, part 2, s.48 (2)).

The development of the *Yukon State of the Environment Interim Report: An Update for Environmental Indicators, 2013* was coordinated by Environment Yukon, with contributions from Energy, Mines and Resources and Community Services, as well as the City of Whitehorse, Environment Canada, and the Yukon Land Use Planning Council. The 2013 interim report states that it provides the “best information available [...] in order to update the previous Yukon State of Environment Full Report, 2008” (p. iv). The report is organized into five themes: climate change, air, water, land, and fish and wildlife. Each theme has one to three key issues, which are monitored using two or more indicators, for a total of 22 indicators.

The report begins with a highlights section that describes high-level findings for each theme. The report introduction explains the purpose and importance of environmental sustainability reporting for Yukon, including monitoring environment performance, contributing to future decision-making, and fulfilling the legislative mandate

for reporting. The purpose and intended use of indicators are described as well as the criteria for indicator selection. Lastly, the introduction features the excerpts of the Yukon *Environment Act (2002)* pertaining to state of environment reporting (sections 47 through 50).

For each indicator, seven sections are used to structure the information presentation: What is the issue?; What are the indicators?; What is happening?; Why is it happening?; Why is it significant?; Taking action; and Data quality. The indicator findings are presented in various forms in these sections, including descriptive text, maps, tables and figures. Additional related findings are provided using available data related to the issue, often at different scales (provincial, regional, and local).

The first section, 'What is the issue?', gives a brief description of the importance of the issue, what is at risk, and the major activities or processes that affect performance. The next section, 'What are the indicators?', explains what is being measured, and includes the source of the data, along with a chart or figure presenting the findings. Often more than one indicator is used to describe the issue. For example, for solid waste management, the indicators used are total annual tonnage of water being handled at the City of Whitehorse Waste Management Facility (2000-2011), Whitehorse waste diverted through recycling and composting compared to waste generated, and curbside collection of garbage and organics from single family households in Whitehorse between 2000 and 2011.

The three sections 'What is happening?', 'Why is it happening?' and 'Why is it significant?' are sometimes combined, and feature the contextual discussion on the significance of the findings for Yukon's environment. The 'What is happening?' section is often a bulleted list that features description of the status, trend, and performance relative to Canadian average. It also touches on historical perspectives, associated impacts, the scope of monitoring efforts, and confidence in indicator accuracy.

The 'Why is it happening?' section contains information on causal relationships, major sectors of the economy or major activities that contribute to the indicator performance, reasons for poor performance, regional influences and drivers, and improvements to management. For example, this section includes statements such as "The cyclical nature of Yukon's resource economy significantly affects GHG emission

levels. Emissions were high in 1990 and low in 2010, which can be linked to the fact that there was more activity in Yukon's mining industry in the 1990s than in 2010" (p. 6). For regional land use planning, the section describes what is in the land use plans, the type of framework being used, the status of the Peel Watershed Regional Land Use Plan, a map of Yukon planning regions and public consultation activities.

The 'Why is it significant?' section covers the local, regional, territorial and global aspects of the issue that make it a relevant and important issue for Yukoners. This includes issues such as the importance of climate change in the territory (e.g. "Although Yukon GHG emissions have limited influence over global emission levels, Yukon government is prepared to demonstrate environmental leadership and responsibility as it communicates the magnitude of northern climate change impacts to the rest of the world." (p. 6)), and issues of local significance ("Lake trout are considered an indicator species due to their slow growth, position at the top of the aquatic food chain, reliance on healthy and clean habitats, and high value in Yukon fisheries. Healthy lake trout populations are indicative of the general health of the entire aquatic ecosystem. The status of lake trout fisheries informs decisions made by fishery managers to maintain sustainable fisheries." (p. 44)).

In the 'Taking action' section, the government describes the plans, goals, and activities being undertaken by government departments, agencies, and committees, as well as civil society and aboriginal organizations, to address the given issue. This section features progress reporting on the implementation of relevant strategies, such as the Pan-Territorial Adaptation Strategy, or Solid Waste Action Plan. It describes projects, partnerships, educational programs, monitoring programs and the activities of committees. Finally, the data quality is described including the source of data and any pertinent information on reliability, scope or limitations.

For most themes, in addition to the issues and indicators, there is a subsection featuring an interesting story that relates to the theme. For example, under the air quality theme, the interesting story featured is 'Landfill burning ends across Yukon' and under the water theme, two interesting stories are included: 'New Yukon water website' and 'White Gold Cumulative Effects Study'. These stories describe new or on-going government initiatives that contribute to improved environment performance and fulfill

commitments and goals made in other plans and strategies. Two of the interesting stories featured provide new sources of information for Yukoners to inform their decision-making: the stories on the 'New Yukon water website' and the 'New bear incident map'.

The *2013 Interim Yukon State of the Environment Report* provides trends information, performance targets, and benchmarking. Trends are provided for most indicators, with the longest running trend running from 1948-2011 for annual Canadian temperature. Another example of long term trend information included is the number of Chinook salmon spawning in the Canadian portion of the Yukon River from 1982-2012. Performance targets are provided in the text, most often in the taking action section, for sector specific targets for GHG emissions reductions, solid waste diversion, salmon spawning escapement and conservation. Notably, the indicator for sustainable lake trout harvest contains a graph depicting the sustainability of lake trout harvest by lake for 2011. While no data from other jurisdictions are provided in figure or graphs, a few indicators include inter-jurisdictional comparisons in text. These indicators are GHG emission, average temperatures, and air quality, and mostly compare Yukon's performance to the Canadian average.

A breadth of indicators is used in this report that cover both Yukon-specific issues and general indicators of sustainability progress. The indicators that specifically reflect sustainability issues in Yukon include several indicators devoted to Yukon's wildlife, such as status of management plan, mercury level in caribou, returns of spawning Chinook salmon, and status of lake trout fisheries in Yukon. The importance of natural resource management in the territory is also reflected by indicators on status of regional management plans related to land use, resources and protected areas, as well as status of community-based wildlife plans and species plans. Reflecting the importance of these plans for residents, the report states, "Regional planning is intended to reflect the traditional knowledge, experience and recommendations of residents as well as incorporate science and broad socio-economic and environmental interests" (p. 30). General indicators on sustainability progress used in this report include ambient particulate matter, species at risk, GHG emissions, water quality index, and waste diversion.

The report contains sufficient information to contribute positively to government accountability for environmental sustainability performance and public education and awareness on environmental issues in the Yukon. The report contains several process-based, administrative indicators that monitor government progress in areas of interest. The process-oriented indicators include status of management plans related to land use, status of parks and other protected areas in Yukon, status of community-based wildlife plans and species plans and status of local area plans and zoning regulations.

4.9. Northwest Territories

The Northwest Territories (NWT) publishes an online state of the environment report, last updated in 2012. A highlights report, which features a subset of the indicators, is also published periodically, most recently in 2011. The online report contains the findings and analysis for the full suite of indicators and is more up to date than the highlights report. The report was developed by the Department of Environment and Natural Resources with input from various agencies and others.

The purpose of the NWT State of the Environment Report is “to provide information about our changing environment to identify trends and help make decisions so NWT residents can continue to enjoy clean air and productive forests, land, waters and wildlife.” (NWT, 2012, SOE Welcome). The stated objectives of the NWT State of the Environment Report are to: provide an assessment of environmental status and trends in the NWT; provide data and information for territorial, national, and international state of the environment initiatives, and; provide an early-warning system of possible impacts resulting from environmental change (NWT, 2012).

The framework used by NWT is a variation of the DPSIR. Each indicator is identified as a driving force, pressure, state, or stewardship. Each of the sections is addressed using three or more ‘focal points’ (20 in total), under which associated indicators track performance. The driving force focal points cover global trends in climate and weather patterns, energy use, greenhouse gas emissions, populations and economies that influence long-term changes in the Arctic. The pressure focal points are trends in human travel, industrial development, human-caused landscape changes, and levels of solid waste and contaminants. The state focal points cover air, water,

vegetation, wildlife, species at risk and genetic resources in the territory. Finally, the stewardship indicators, which are akin to response indicators in the DPSIR framework, track actions that reduce pressures and impacts on the environment. In the NWT, the stewardship focal points are gathering country foods and participating in traditional economies, environmental education programs, and conservation activities.

While the selection criteria for the indicators are not provided, the report describes the indicators as “chosen to communicate key information on our environment in a way that is relevant to the people of the NWT.” (NWT, 2012). Furthermore, many of the indicators are used by the NWT to share information with national and international programs, such as NWT Environmental Audits, NWT Cumulative Impact Monitoring Program (Indian and Northern Affairs), Canada’s Ecosystem Status and Trends Report, the United Nations 2010 Biodiversity Target, and the Global Biodiversity Outlook. The report currently uses 69 indicators: 18 for driving forces, 13 for pressures, 29 for states, and 9 for stewardship. The introduction notes that additional indicators will be developed and incorporated into future reports. The report features data collected by the territorial government, the federal government, international organizations, Inuit organizations, regional organizations, volunteer-based monitoring programs and universities.

The report opens with a welcome section that introduces the reader to the importance and purpose of indicators, the objectives of reporting, how to provide feedback on the report, links for additional information, and a description of the organization of the report. This introductory page also describes the new ecologically based landscape classification for the NWT, upon which the government will organize environmental assessments, monitoring and decision-making. Following the introduction, a webpage provides links and descriptions of the highlight reports and the 2010 biodiversity report. The highlight reports also include three sections not featured in the web version: a message from the Minister of Environment and Natural Resources, a page that describes the government’s policies on the complementary use of traditional knowledge and ecosystem science, and a page on key insights that gives the high level trends featured in the report.

The remainder of the NWT State of the Environment Report is grouped along the Driving force – Pressure – State – Stewardship framework, using a webpage for each of

the 20 focal points. The webpages for each focal point feature an introduction to the issues that are being measured, followed by the presentation of each indicator. The focal point introduction often includes the scientific underpinnings of the issue, major impacts and human activities, governance issues, and key definitions. For example, under the wildlife focal point, the importance of monitoring species populations is described as follows: “Some northern wildlife species experience large natural fluctuations in population numbers over time. [...] A change or a decline in these cycles could indicate a change in the environment that should be examined.” (Northwest Territories, 2012, section 15)

Each indicator is presented separately using six or seven subsections: “Introduction”, “NWT focus”, “Current view: status and trends”, “Looking forward”, “Looking around” (featured for select indicators), “Find out more”, and “Other focal points”. The length of the introduction varies significantly between indicators. For all, the introduction describes what is being measured, the source of the data, data gaps or limitations, and key definitions. For some indicators, such as trends in development activities requiring a permit in the NWT, the introduction gives background information to orient the reader to the issues covered under the indicator.

The NWT focus section places the indicator in the context of the society, economy and ecology of the NWT, as well as current management goals and initiatives. For example, for the indicator ‘Trends in spills of hazardous materials’, the section describes the increased risk associated with spills in northern ecosystems: “petroleum will degrade very slowly in cold climates, increasing risks of exposure to wildlife and plants. Different types of activities are linked to different types of spills, each with their own material and levels of risk to the environment.” (NWT, 2012). For the indicator ‘Trends in barren-ground caribou population size in tundra-taiga ecosystems’, there is a description of how some indicators were chosen to reflect the specific values of residents: “Caribou are an important source for food, clothing, and cultural identity for Aboriginal people in the NWT, and one of the NWT’s most important wildlife resources” (NWT, 2012).

The ‘Current view: status and trends’ section presents the findings for the indicator. The data are provided often in a figure, table or map. Aerial photographs are

used for the thermokarst indicator. Some indicators only feature descriptive findings, such as solid waste (due to limited data), active-layer thickness, trends in range expansions of mammals, and trends in number of introduced and alien mammals, birds and fish. These last two indicators are described using observational findings. For the trends in range expansions of mammals indicator, sightings of range extensions or vagrancy for five species of even-toed ungulates and five species of carnivores are provided.

The “Looking forward” section describes the expected trend for that issue into the future, government priorities in that area, and anticipated changes to the monitoring and reporting regime. This section often includes quotes and recommendations from other reports, such as forward-looking studies by international organizations, and other NWT studies and reports. The influence of external forces on the issue is also presented. For example, for the indicator on trends in development activities requiring a permit in the NWT, the impact of reduced commodity prices and difficulties in financing projects in remote areas on the feasibility of future natural resource development projects is explained.

The ‘Looking around’ section, included for many indicators, compares the NWT performance to other countries, the Canadian average or other arctic jurisdictions. For example, for the indicator on road density and other maintained linear features, the section compares the data for NWT with that of the BC portion of the Taiga Plains and Alaska. The ‘Looking around’ section also features information on specific policy development initiatives in other jurisdictions and information on broader Arctic initiatives.

NWT’s online State of the Environment report features trend information for nearly every indicator, benchmarking information for many, but only provides a performance target for only one of the indicators. The report features long-term trend data for several indicators including global average temperature (1850-2005), transits through the Northwest Passage by type of ship (1906-2011) and trends in arctic sea ice (1963-2010). It also includes projected data for climate indicators, such as temperature anomalies for the arctic (1901-1950) and predicted changes in surface air temperature and precipitation (2080-2099). The ‘Looking around’ section included for many indicators

provides benchmark information, particularly with respect to other northern jurisdictions, such as Alaska and the Yukon.

Reflecting the unique environmental circumstances of a northern territory, NWT's report features many indicators that measure issues that reflect its unique society and economy. Several indicators reflect the distinctive values and economy of NWT residents including trends in cadmium and mercury in caribou kidneys, trends in country food use, trends in trapping, trends in the use of Aboriginal languages, and trends in global supply and demand for northern natural resources, including NWT-specific resources such as marten pelts. Indicators that reflect the specific ecosystems of the northern territory include, ground temperature in permafrost, trends in willow ptarmigan and grouse in tundra-taiga ecosystems, vertical land motion, and trends in Dall's sheep in mountain ecosystems. For the willow ptarmigan indicator, following the cycles allows biologists to predict a population peak in 2016-2017, providing a future signal for assessing ecosystem change. The graphic depicting net migration of people in and out of the NWT from 1987-2012, links the trend line to economic changes associated with the boom-and-bust cycle of natural resource development projects, such as the economic recession, closure of the army base in Inuvik (Taiga Plains) (1985), construction and opening (1998) of the Ekati diamond mine, up to the economic recession (2008).

The report includes indicators that provide information on government performance in some areas. Performance indicators include the solid waste indicators on trends in beverage containers that are returned for reuse and recycling, and trends in single-use retail bag distribution, which are linked to the effectiveness of the Beverage Container Program and Single-use Retail Bag Program, respectively. Some other indicators that monitor government performance are the trends in environmental remediation of contaminated sites, and the trends in Protected Areas and Land Use Plans.

In addition to the many NWT-specific indicators that are likely of interest to residents, the report includes several sections that contain sufficient information to contribute to public education and encourage social participation. An example of this type of information is the sizeable text box on 'General Fish Consumption Guidelines for

NWT' under the status of mercury in fish indicator, which explains the health concerns associated with fish consumption in the NWT. The indicators under the stewardship section also give residents information on the availability of environmental education opportunities for youth (participation in programs such as take a kid trapping program, tundra science camp, Tibbitt lake fire study camp, Dehcho youth ecology camp, fall fish hanging program, etc.), and trends in participation in environmental programs (participation in rebate programs, number of projects, energy audits performed, etc). There are also two important sections that encourage residents to become engaged in the state of environment reporting process itself. The final section of the online report, entitled "Your Input", describes the importance of incorporating traditional knowledge into the government's monitoring and reporting system, including a description of the Traditional Knowledge Implementation Plan, and the intention to develop traditional knowledge indicators for use in subsequent reports. Finally, the reader is encouraged to contact the Department of Environment with suggestions on additional indicators to provide insights on how the NWT's environment is changing.

4.10. Canada

The federal government publicly reports on environmental sustainability using the Canadian Environmental Sustainability Indicators (CESI). The stated purpose of the CESI system is three fold: to measure the progress of the Federal Sustainable Development Strategy, to report to Canadians on the state of the environment, and to describe Canada's progress on key environmental sustainability issues (Environment Canada, 2013). The indicators are prepared by Environment Canada with the support of other federal government departments, such as Health Canada, Statistics Canada, Natural Resources Canada, Agriculture and Agri-Food Canada, as well as provincial and territorial government departments. The report is available online and is updated as new data become available.

The conceptual frameworks used by the federal government are the policy-based and theme-based approaches. The indicators were designed to be relevant to the government's policy, to measure progress of the Federal Sustainable Development Strategy, and to fulfill Environment Canada's commitments under the Canadian

Environmental Protection Act (CEPA) and the Department of the Environment Act to report to Canadians on the state of the environment. The indicators are divided into three themes: air and climate, water, and nature. In total there are 54 indicators: 17 for air and climate, 22 for water, and 15 for nature. Each theme is subdivided into issues under which the indicators and other information are presented. The air and climate theme has four issues: air quality, emissions to air, weather, and human health impacts related to pollution. The water theme has four issues: water quantity and availability, water quality, regional ecosystems, and pressures on water quality. The nature theme covers three issues: habitat protection, wildlife, and biological resources.

A separate webpage dedicated to the data and methods is available for each theme. The data and methodology for the calculation of each indicator are explained using six sections of information: introduction, description and rationale, data (which includes information on the source of the data, the spatial coverage, temporal coverage, completeness, and timeliness), methods, caveats and limitations, and references and further reading.

For some themes, an introductory webpage features background information on that issue, including the sources or causes, the associated effects (such as human health and ecological effects) and the factors and activities that influence the performance of the indicator. Webpages are also provided for inter-jurisdictional comparison and additional information. For example, a webpage is provided for an inter-jurisdictional comparison on urban air quality and a webpage with additional information is provided for 'Status of Key Findings Related to the Health of Canada's Ecosystems'.

Each indicator is presented on a separate webpage. Beside the links to each indicator page, the month and year of the last update is given. Most indicators have been updated within the past year or two. In general indicator webpages include an introduction, data presentation, and a discussion. The introductions include a variety of information related to the indicator. High-level findings such as the Canadian average, environmental performance, and general trend are often included. The importance of the issue to the economy, ecology and society, regional or provincial differences in indicator importance, and what the indicator tells us about environmental sustainability in Canada are included.

The introduction also includes links to government action, policies, initiatives and legislation. For indicators where government actions have markedly influenced performance, such as for sulphur oxides and mercury emissions, the agreements and legislation that led to improved performance are described. In the case of these pollutant emissions, the authors describe technological upgrades, international agreements, closing certain facilities and strengthening legislation in the 1990s. For the water quality indicator on PBDEs in fish and sediment, the federal government's Chemicals Management Plan and federal environment quality guidelines are described, as well as the importance of international agreements such as the Stockholm Convention on Persistent Organic Pollutants and the Protocol on Persistent Organic Pollutants (POPs) of the United Nations Convention on Long-range Transboundary Air Pollution (LRTAP).

The indicator findings are presented using a figure or map, accompanied by supporting information, such as a description of the trend, explanations for anomalies, caveats to its interpretation, and explanations of key terms and concepts. A brief technical explanation of the indicator calculation is provided and links to the data sets for the chart, and to the webpage on the methodology are given. The monitoring program is also sometimes described and in some cases information on the frequency of sampling or density of monitoring stations is given. For instance, the maps of greenhouse gas emissions from large facilities and of water quantity at monitoring stations in each drainage region give information on both the indicator performance and the monitoring program.

The discussion contains information similar to that in the introduction but provides more in depth analysis of the indicators background and implications. Historical information on past change for some indicators provides the reader a richer context to evaluate environmental sustainability performance. For the regional ecosystems indicator on phosphorus level in the Great Lakes, the authors recount excessive algal growth in many regions of the Great Lakes beginning in the 1970s followed by steady improvements due to measures put in place under the 1978 *Canada-U.S. - Great Lakes Water Quality Agreement*. Another type of analysis featured in the discussion section is the effectiveness of different types of policy approaches and conservation incentives. Nearly the entire discussion for the residential water use indicator focuses on the merits and challenges of residential water metering. Finally, some discussion sections describe

the importance of promoting desirable activities as a way to reduce environmental degradation. For example, for the freshwater quality in Canadian rivers indicator, the authors state, “The decline in water quality can be slowed by reducing pollution, planting trees along a river, upgrading a wastewater treatment plant, or adopting beneficial land management practices” (Environment Canada, 2013, Freshwater Quality in Canadian Rivers)

The CESI report provides trends for most indicators, benchmark information for many indicators and a performance target for only one of the indicators. Most indicators feature trend information for the past 5-15 years. Some indicators feature longer time frames of data such as agro-environmental performance indices for soil and water quality in Canada (1981-2006), while others, such as freshwater quality only have data for 2008-2010. When overall trends mask important nuances, the details are described in text. For example, the migratory bird population indicator trend notes that, “While trends reflect the overall patterns, individual species or species groups respond to different environmental factors. For example, grassland birds in Canada are generally declining and raptors are generally increasing” (Environment Canada, 2013, Trends in Canada’s Migratory Bird Populations). Comprehensive benchmarking is provided for a number of indicators. For example, mercury emissions are compared between global regions (East and Southeast Asia, Sub-Saharan Africa, South America, South Asia, Europe) and a comparison of ambient levels of air pollutant in 30 international cities including six in Canada. Benchmarks are also provided for total air pollutant emissions, ratio of emissions to GDP, renewable annual water supplies, distribution of world carbon emissions from fuel combustion, global trends in bird species survival, and terrestrial protected area. Finally, the only indicator that is reported relative to a performance target is GHG emissions. Other indicators feature intrinsic performance assessments (e.g. very good, good, moderate, poor) such as the water quality index, agro-environmental performance indices for soil and water quality, and ecological integrity status and trends of national parks.

The CESI report includes Canada-specific indicators along with general indicators of environmental sustainability. Canada-specific indicators include shellfish growing area quality, drinking water advisories, and restoring Great Lakes Areas of

Concern. General environmental sustainability indicators include GHG emissions per capita and per unit GDP, residential water use, and national freshwater quality.

The report also provides information on governmental performance with respect to environmental sustainability. Due to the close relationship between several indicators and federal policy objectives, the reader is able to judge progress in that area over time. Indicators with a strong link to policy include progress on Canadian Great Lakes Areas of Concern (1987 to 2012), agri-environmental performance indices for soil and water quality in Canada (1981-2006), monitored disposal at sea sites requiring no management action (2001 to 2010), progress toward Canada's greenhouse gas emissions reduction target, and trends in population sizes of species at risk compared to recovery strategy objectives (2011). Another interesting group of performance measures under CESI are those that link environment and human health. The cardiopulmonary mortality risk attributable to air pollutants indicator, air health indicator, and levels of exposure to substances of concern indicators give health information that informs Canadians of the current risks to wellbeing as well as establishes a baseline of health indicators associated with environmental quality to track over time.

Finally, the CESI system incorporates sufficient information to contribute positively to public education, participation in environmental sustainability and government accountability and transparency. The introductory and discussion sections provide rich information on the issues associated with the indicator results such as key social and economic drivers and how the issues are influenced by citizens, industry and governments. Each indicator webpage features links to other related indicators, other government websites for more information, and related government reports such as the state of the parks reports and wild species reports. Furthermore, links to the CESI interactive maps and downloadable datasets allow readers to assess the data at the scale most interesting to them, from provincial level to local areas, featuring details on the data of interest at specific monitoring sites or industrial facilities. Finally, the reader can opt to receive a newsletter to stay abreast of developments and updates to CESI.

Chapter 5.

Best Practice Evaluation of Monitoring and Reporting by Canadian Governments

5.1. Introduction

This chapter features the evaluation of environmental sustainability monitoring and reporting practices of the provincial, territorial and federal governments of Canada. The methodology is described, including the best practice criteria, the methods used for data collection, the evaluation technique and the limitations of the methodology. The evaluation results are presented and summarized, highlighting key differences between jurisdictions.

5.2. Methodology

5.2.1. Best Practices for Evaluating Environmental Sustainability Reporting

Environmental sustainability monitoring and reporting are components of a larger system for environmental sustainability planning. Reflecting the need to incorporate environmental objectives into government planning and decision-making, many governments use Environmental Sustainability Planning Systems (ESPS) as part of their approach to sustainable development. ESPS can be thought of as the environmental component of National Sustainable Development Strategies (NSDS). While NSDS integrate social, economic, *and* environmental objectives into governmental strategic planning and policy initiatives, ESPS focus primarily on the integration of *environmental* objectives into government planning and policy. Best practice principles and criteria

established for evaluating NSDS are used in this study to evaluate environmental sustainability monitoring and reporting practices, a component of the ESPS and NSDS.

National Sustainable Development Strategies have been evaluated in several studies since the global community committed to Agenda 21 at the WCED in 1992. While the approach to NSDS development and implementation can vary widely between countries, most evaluations of NSDS have focused on identifying key issues and challenges to environmental sustainability planning to improve planning and policy making (OECD, 2001). Over the past two decades, more than a dozen NSDS evaluation methodologies have been produced, resulting in a large list of best practices. Ellis *et al.* (2010) developed a comprehensive evaluation framework based on a systematic review of best practices used in other studies to evaluate the Environmental Sustainability Planning Systems component of National Sustainable Development Strategies. This framework has been used to evaluate the environmental planning systems of Canada and Germany (Ellis *et al.*, 2010, Zeiger, 2012, Bedore, 2013). Table 8 provides a list of the studies reviewed by Ellis *et al.* (2010) and displays the best practices that were identified in each study. A detailed description of the review is provided in Ellis *et al.* (2010). Collectively, the studies reviewed by Ellis *et al.* (2010) consistently include the following eight best practices for an effective planning system:

1. Comprehensive goals and targets,
2. Effective strategy,
3. Integration,
4. Leadership and accountability,
- 5. Monitoring,**
- 6. Adaptive management,**
7. Stakeholder collaboration, and
8. Legal framework.

This study focuses on only one subset of environmental planning systems of governments: environmental sustainability monitoring and reporting practices. Therefore, the two best practices identified by Ellis *et al.* (2010) that will be used in this evaluation are monitoring and adaptive management (bolded in the list above). The best practices for monitoring and adaptive management are described below.

Monitoring

The pursuit of environmental sustainability requires long-term monitoring to provide government, citizens and other stakeholders with information that can be used to inform decision-making and to provide feedback on progress towards sustainability objectives. Given that environmental sustainability planning is an adaptive and iterative process, this feedback provided by monitoring is essential.

Environmental sustainability indicators should be developed to assist governments in monitoring, measuring and communicating on progress. Indicators should reflect a breadth of environmental sustainability issues as well as be specific to the strategies and objectives of the government and society. There should be regular, public reporting to communicate broadly on the state of environmental sustainability and progress on strategies and commitments. Further, governments should adopt a legislative requirement for public reporting on the monitoring findings and indicators to ensure regular, long-term implementation of the practice. Finally, monitoring should be unbiased and transparent and is therefore best pursued by an independent body.

Adaptive Management

Adaptive management is a framework for resource management that treats policy interventions with the environment as experiments (Lee, 1993). In the face of uncertainty, management approaches are designed to intervene in the system while collecting information about the system in order to improve the management approach (Holling 1978). Monitoring data provide signals of emerging environmental changes, pressures on the system, and threats to ecosystem function. Better understanding of risks or opportunities for improvement gleaned from monitoring data should be used to inform a constant effort at adapting and refining methods through revisions to existing policies and strategies and the development of new approaches (Lee, 1993). To this end, environmental sustainability planning systems should include a mandatory process to review monitoring results with a view to amending plans and strategies based on findings.

Adaptive management is a complex concept with a range of interpretations. It is therefore difficult to measure the achievement of this approach using a single indicator. Nevertheless, a mandatory process for the review of plans and strategies based on

monitoring data indicates a government's commitment to continuous improvement based on new information and reflects the general process for adaptive management.

Table 5.1. Best Practices identified by Ellis et al. 2010 from a review of thirteen studies on National Sustainable Development Strategies. The monitoring and adaptive management best practices (shaded) are used in this evaluation.

	Comprehensive Goals with Measurable Targets	Effective Strategy	Integration	Monitoring	Leadership and Accountability	Adaptive Management	Stakeholder Collaboration	Legal Framework
World Bank 1995	X	X	X	X		X	X	X
Kenny and Meadowcroft 1999	X	X	X	X	X		X	X
Meadowcroft and Lafferty 2000	X		X	X			X	X
OECD 2001	X	X	X	X	X	X	X	
UN DESA 2002	X	X	X	X	X		X	
Dalal-Clayton and Bass 2002	X	X	X	X	X	X	X	
EU 2004	X		X	X	X		X	
IISD 2004	X	X	X	X	X	X	X	X
OECD 2004	X	X	X	X			X	
CESD 2005	X	X	X	X		X	X	
OECD 2006			X	X	X	X	X	
Gunton et al. 2006	X	X	X	X	X	X	X	X
Gunton and Joseph 2006	X	X	X	X	X	X	X	X

5.2.2. Quantifying Best Practice Criteria

Assessing the degree to which a jurisdiction's environmental sustainability planning system meets the best practices is challenging. Qualitative assessments of NSDS or ESPS are susceptible to bias as they are based on the subjective assessment of the evaluator. In order to increase the transparency of the approach, Gunton *et al.* (2006) and Ellis, *et al.* (2010) developed a quantitative assessment based on best practice criteria, presented as key questions meant to address each best practice. Specifically, the Ellis study established a list of 45 detailed questions to assess the degree to which each of the eight best practices is met. The present study employs an adaptation of the eight questions developed by Ellis *et al.* (2010) to assess the best practices for monitoring, reporting and adaptive management (Table 9). A quantitative assessment of two of the evaluation criteria – independent progress monitoring and adaptive management – is not available and therefore a qualitative assessment is applied based on whether the criterion is fully met, largely met, partially met, or not met, as described in table 9. For some criteria, fewer scale gradations are used.

In order to assess whether the monitoring and reporting practices of government adequately cover common environmental sustainability issues, a suitable set of environmental sustainability indicators for Canada provides a basis for evaluation. A set of 43 environmental sustainability indicators for Canada was developed by Gunton *et al.* (2006) in order to assess the adequacy of the federal environmental sustainability monitoring system. The present study uses 42 of the 43 categories identified in the Gunton study, listed in table 10. The category of “natural resource efficiency” was not used in this evaluation because it is attributable to many different indicators used across jurisdictions and was therefore difficult to assess consistently.

Table 5.2. Criteria for quantitative evaluation of environmental sustainability progress monitoring and reporting, and Adaptive Management (adapted from Ellis et al., 2010)

Monitoring and Reporting	
There should be regular, independent public reporting to communicate broadly on environmental sustainability and progress on plans and commitments.	
1. Monitoring information is easily accessible to the public	<p><i>Is monitoring information available in a comprehensive report and/or website?</i></p> <ul style="list-style-type: none"> ● - Fully met. All monitoring information is made publicly available in a comprehensive report and/or website ◐ - Partially met. Monitoring information is made available but there is no single, comprehensive point of access to that information. ○ - Not met. Monitoring information is not made publicly available.
2. Regular reporting on sustainability progress	<p><i>Is there a regular public monitoring report measuring sustainability progress?</i></p> <ul style="list-style-type: none"> ● - Fully met. The government has published a report within the past 3 years ◐ - Largely met. The government has published a report within the past 5 years ◑ - Partially met. The government has published a report within the past 7 years ○ - Not met. The government has not published a report within the past 7 years
3. Clear mandate for regular reporting	<p><i>Is there a clear mandate for regular environmental sustainability reporting?</i></p> <ul style="list-style-type: none"> ● - Fully met. The government has made a legislated commitment to publishing a report on a regular basis, at least once every 5 years ◐ - Largely met. The government has made a policy commitment to publishing a report on a regular basis, at least once every 5 years ◑ - Partially met. The government publishes a report on a regular basis, however the frequency for reporting is not defined, or is less than once every 5 years ○ - Not met. The government has no clear mandate or schedule for reporting
4. Independent progress monitoring	<p><i>a. Is the environmental sustainability monitoring report prepared by an independent agency?</i></p> <ul style="list-style-type: none"> ● - Fully met. ○ - Not met. <p><i>b. Is progress monitoring performed by an independent agency?</i></p> <ul style="list-style-type: none"> ● - Fully met. An independent agency performs regular progress monitoring on a breadth of environmental sustainability issues. ◐ - Largely met. An independent agency performs progress monitoring on a breadth of environmental sustainability issues but not on a regular basis ◑ - Partially met. An independent agency performs monitoring on a limited number of environmental sustainability issues. ○ - Not met. There is no environmental sustainability progress monitoring by an independent agency.

5. Environmental categories covered in the report	<i>What proportion of the 42 environmental categories is included in the monitoring report?</i>
6. Assessing progress relative to targets	<i>What proportion of the environmental indicators used by the jurisdiction is assessed relative to targets?</i>
7. Assessing progress relative to trends	<i>What proportion of the environmental indicators used by the jurisdiction is assessed relative to trends?</i>
8. Assessing progress relative to other jurisdictions	<i>What proportion of the environmental indicators used by the jurisdiction is assessed relative to comparable jurisdictions?</i>
<p>Adaptive Management</p> <p>There should be mandatory adjustments to the province's environmental sustainability planning system to address deficiencies identified in monitoring.</p>	
9. Adaptive Management	<p><i>Is there a mandatory review and revision of the environmental sustainability planning system based on the monitoring results?</i></p> <ul style="list-style-type: none"> ● - Fully met. The government has a clearly articulated process for mandatory review and revision of the province's environmental sustainability planning system based on the monitoring result. ◐ - Partially met. The government has articulated a process for, or intention to, review certain strategies based on monitoring results but there is no mandatory requirement to address deficiencies identified during monitoring. ○ - Not met. The government does not have a clear process for mandatory review and revision of the province's environmental sustainability planning system based on the monitoring results.

Table 5.3. Forty-two environmental categories representing an appropriate set of environmental sustainability indicators for Canada, adapted from Gunton et al. (2006).

Air Quality	1. Sulfur 2. Nitrogen 3. Volatile Organic Compounds 4. Particulates 5. Carbon Monoxide 6. Ozone
Drinking Water Quality	7. Heavy metals 8. Dissolved Solids 9. Turbidity
Surface Water Quality	10. Heavy Metal 11. Phosphorus 12. Nitrogen 13. Dissolved Oxygen 14. Biochemical Oxygen Demand 15. Suspended Solids 16. Coliform
Pollution Emissions	17. Greenhouse Gas 18. Nitrogen 19. Volatile Organic Compounds 20. Carbon Monoxide 21. Particulates 22. Ozone Depleting Substances 23. Sulfur Oxide
Natural Resource Consumption	24. Energy Consumption 25. Energy Efficiency 26. Clean/Renewable Energy Production 27. Water Conservation
Waste Generation and Treatment	28. Municipal Waste 29. Hazardous Waste 30. Sewage Treatment 31. Recycling
Agricultural Practices	32. Pesticide Use 33. Fertilizer Use
Protecting Nature	34. Biodiversity 35. Species at Risk 36. Protected Areas 37. Fisheries Harvest 38. Forest Harvest 39. Sustainable Forest Management Certification
Transportation	40. Public Transit Use 41. Private Transit Use 42. Government Green Procurement

5.2.3. Data Collection

Data were collected from government resources related to the provincial, territorial and federal governments' ESPS for information on reporting practices, monitoring agencies, legislative requirements and commitments to revising strategies based on monitoring results. Government resources covered by this information gathering include plans, strategies, departmental reports, legislation, and environmental reports. This information was gathered from all departments with a mandate over issues directly related to environmental sustainability. Commonly, these include the departments of environment, natural resources (including forestry, agriculture, fisheries, energy and mining), and sustainability. Only information sources with a broad jurisdiction-wide scope were included in the review (i.e. strategies specific to a geographical area, sub-issue or economic sector were not used). The information sources reviewed for each jurisdiction are listed in the completed evaluation guides in Appendix.

In order to ensure a comprehensive and organized review of this information, an evaluation guide was developed to structure data collection from each jurisdiction. The evaluation guide used was adapted from a version developed by Ellis, Gunton, and Rutherford (2010). Completed guides for each province, territory and the federal government are available in Appendix.

Once the data collection was complete, the evaluation guide was sent to a contact in the branch or office responsible for or most closely related to environmental sustainability monitoring and reporting for the jurisdiction. The contacts for each province were asked to review the data in the evaluation guide to ensure it is complete and correct. Contacts in British Columbia, New Brunswick and Nova Scotia provided responses to the evaluation guides. The responses corroborated the information identified in the guide and for British Columbia and New Brunswick, the respondents provided information on other publically available reports (such as regional or issue-specific monitoring reports). Once the evaluation guides were completed, they were used to conduct the evaluation.

5.2.4. Study Limitations

While every effort has been made to ensure this evaluation is a comprehensive reflection of government environmental sustainability reporting in Canada, there are several limitations that should be considered when reviewing the evaluation findings. Firstly, due to the complex nature of environmental sustainability planning as well as overlapping environmental jurisdiction in Canada, there are several key sustainability issues that a government may be more or less likely to report on due to the nature of jurisdiction over these issues. For example, the federal government is more likely to report on biodiversity as they are party to the United Nations Convention on Biological Diversity, and the provincial governments would be more likely to report on natural resource management, such as forestry and renewable energy, as these fall under provincial jurisdiction. In reality, however, it is appropriate that provincial, territorial and federal governments in Canada report on all of these issues, and that is in fact the case. For instance, the federal government in Canada is one of six jurisdictions that reported on sustainable forest management as a key indicator in their reporting. Issues of a primarily municipal scope, however, may be underrepresented in federal and provincial reporting. For instance, few of the jurisdictions report on public transit use, one of the 43 environment categories.

Secondly, this evaluation considers only publicly available reports on environmental sustainability indicators. Due to the breadth and complexity of environmental sustainability, many departments and agencies within a government may be responsible for some aspect of its management, such as the departments, ministries and agencies responsible for environment, sustainability, natural resources, agriculture, forestry, fisheries, mines, health, municipal affairs and others. These issues are also covered by a myriad of strategies, actions plans, frameworks and agreements within these governments. Government often use environmental sustainability indicators to measure the performance of these departments/ministries/agencies and to track progress on these strategies/plans/frameworks/agreements. This evaluation did not, however, consider the environmental sustainability reporting done at the departmental or strategy-level. Only government-wide environmental sustainability reporting was evaluated. This was done for two reasons. Firstly, it is difficult to consider such a wide breadth of materials in the evaluation due to the inaccessibility of the monitoring data.

Secondly, governments should report on progress towards environmental sustainability as a stand-alone government-wide effort to be transparent, accountable and to inform its citizens. When governments do not publish a complete, jurisdiction-wide report on environmental sustainability progress, it is very difficult for stakeholders to ascertain the jurisdiction's performance as a whole. Nonetheless, there may be some reporting that was not included in the evaluation.

The provincial, territorial and federal governments are evaluated based on a set of environmental sustainability indicators for Canada as established by Gunton *et al.* (2006). The 42 environmental categories represent issues that are of interest across Canada and require active management in order to improve the state of the environment. However, they do not reflect the very important practice of including jurisdiction-specific indicators that are tailored to the unique challenges faced by governments throughout such a large and diverse country. Many governments use important jurisdiction-specific indicators (see Chapter 4 for a complete discussion). Often these indicators are local or regional, cover only a portion of the issue, or are completely outside of the 42 environmental categories and therefore are not counted towards the evaluation results.

Finally, this evaluation considers the sustainability reporting practices of the Canadian provinces, territories and federal governments, as they existed at April 18th, 2013, which marks the end of the data collection period. Canadian environmental policy is dynamic and therefore some of the findings may no longer be relevant. It is therefore recommended that the evaluation process is repeated at intervals to track changes in the Canadian ESPS over time.

5.3. Evaluation Results

5.3.1. Introduction

The following sections provide the results of the evaluation of provincial, territorial and federal monitoring and reporting practices. The data on which this evaluation is based can be found in the completed evaluation guides in Appendix. The criteria for monitoring and reporting, and adaptive management are assessed for all provinces and

territories in tables 12 through 20, and a summary is provided in section 5.3.4 (Table 19).

5.3.2. Easily accessible public monitoring information

The first evaluation criterion addressing the best practice for monitoring assesses whether monitoring information is easily accessible to the public. The findings are in Table 11, which is based on the data in Appendix.

Table 5.4. Findings for best practice evaluation criterion 1 on easily accessible, comprehensive public monitoring information.

<i>Best practice evaluation criterion 1</i>	Monitoring and Reporting						
	BC	AB	SK	MB	ON	QC	NB
1. Is monitoring information available in a comprehensive report and/or website?	● Website	● Website	● Report	● Report	○ Partial	● Website	● Report
	NS	PEI	NL	YT	NWT	NU	CAN
	● Report	● Report	○ Partial	● Report	● Website	○ Partial	● Website

Legend

- - Fully met. Monitoring information is made publicly available in a comprehensive report and/or website
- - Partially met. Monitoring information is made available but there is no single, comprehensive point of access to that information.
- - Not met. Monitoring information is not made publicly available

Eleven out of 14 Canadian jurisdictions publish comprehensive environmental sustainability reports. While these reports use a variety of frameworks, formats, content and scope (see Chapter 4), they are all intended to monitor progress towards sustainability using environmental sustainability indicators. Newfoundland and Nunavut do not publish comprehensive monitoring reports; however monitoring information is made available through issue-specific reports. Ontario does not have a province-wide sustainability monitoring report. However, it has indicated that it may adopt this practice

in the future, in response to growing public demand¹. Ontario does, however, publish issue-specific monitoring reports, called “State of the Resource Reports”².

Most jurisdictions continue to publish monitoring data as a stand-alone, periodic report, however a trend towards creating an online report has emerged, particularly among the most populous jurisdiction (Canada, British Columbia, Alberta, and Quebec). This may be in response to public demands for more up-to-date information, as an online report is more easily updated as new information becomes available.

5.3.3. Regular reporting on sustainability progress

The second evaluation criterion addressing monitoring assesses whether the environmental sustainability monitoring report is published, or updated, regularly. The findings are in Table 12, which is based on the data in Appendix.

Table 5.5. Findings for evaluation criterion 2 on regular public monitoring reporting.

<i>Best practice evaluation criterion 2</i>	Monitoring and Reporting						
	BC	AB	SK	MB	ON	QC	NB
2. Is there a regular public monitoring report measuring sustainability progress?	● Online	● Online	● 2013	● 2009	○ None	● Online	○ 2003
	NS	PEI	NL	YT	NWT	NU	CAN
	● 2011	● 2010	○ None	● 2013	● 2009	○ None	● Online

Legend

● - Fully met. The government has published a report within the past 3 years

¹ “In coming years, we expect to see increased concern about the health of our natural environment and ecosystems. As a result, the public will expect that resource information and status reports on the state of natural resources and the environment are readily available. The ministry will create an effective framework for preparing and sharing of this information. A system of monitoring, assessment and reporting will help to gauge our progress, and in the spirit of adaptive management, we will use this information to alter our management approaches or modify our strategies and actions in order to achieve results. Public reporting will ensure that we are transparent and accountable for results. Furthermore, it also enables the public and our clients to better engage as partners in resource management and decision-making.” (Ontario Ministry of Natural Resources, 2005, pg 20)

² These reports are made available at:
<http://www.mnr.gov.on.ca/en/Business/SORR/2ColumnSubPage/REPORTSSECTION.html>

- - Largely met. The government has published a report within the past 5 years
- ◐ - Partially met. The government has published a report within the past 7 years
- - Not met. The government has not published a report within the past 7 years

Most of the jurisdictions that have developed a comprehensive environmental sustainability monitoring report, update that report on a regular basis. Of reporting jurisdictions, only Manitoba, Northwest Territories and New Brunswick have not published a report within the past three years. New Brunswick is the only reporting jurisdiction to have not updated their report within the past five years. Notably, all jurisdictions that publish an online report have updated the data within the past three years (scoring “fully met”).

5.3.4. Clear mandate for regular reporting

Evaluation criterion 3 assesses whether the government has established a clear mandate, preferable a legislated requirement, for environmental sustainability reporting. The findings are in Table 13, which is based on the data in Appendix.

Table 5.6. Findings for evaluation criterion 3 on whether there is a clear mandate for environmental sustainability reporting in each jurisdiction.

<i>Best practice evaluation criterion 3</i>	Monitoring and Reporting						
	BC	AB	SK	MB	ON	QC	NB
3. Is there a clear mandate for regular environmental sustainability reporting?	○	●	●	●	○	◐	○
	NS	PEI	NL	YT	NWT	NU	CAN
	○	○	○	●	○	○	◐

Legend

- - Fully met. The government has made a legislated commitment to publishing a report on a regular basis, at least once every 5 years
- ◐ - Largely met. The government has made a policy commitment to publishing a report on a regular basis, at least once every 5 years
- ◐ - Partially met. The government publishes a report on a regular basis, however the frequency for reporting is not defined, or is less than once every 5 years
- - Not met. The government has no clear mandate or schedule for reporting

Almost half (6/14) of the provincial, territorial and federal governments in Canada have established a legislated mandate for environmental sustainability reporting. Four of the seven jurisdictions that have reported since 2010 (scoring “fully met” for evaluation criterion 3) have a legislated reporting requirement (Alberta, Saskatchewan, Quebec and Canada).

The frequency and requirements for reporting under legislation vary between jurisdictions. For Alberta, Saskatchewan and the Yukon, the legislated requirements are very simple: the government must report on the state of the environment once every year (Alberta), two years (Saskatchewan) or three years (Yukon) (See Appendix for specific legislative commitments). Manitoba’s legislated reporting commitment is to prepare a Provincial Sustainability Report “within one year after the release of data from the national census of the Government of Canada, or at such other times as may be decided by the minister” (Manitoba Sustainable Development Act, section 10(1)). Quebec, however, does not require an annual report but requires that the sustainable development indicators must be “published and made accessible, among other ways, in the manner and under the conditions the Government considers appropriate” (Quebec Sustainable Development Act, section 10).

Manitoba and Quebec also provide more detailed instruction to government on the content and process for establishing their reports. Manitoba’s *Sustainable Development Act* (1998) requires that indicators be selected through a consultative process with the public and experts. Further, Quebec’s *Sustainable Development Act* (2006) mandates the minister to develop the indicators “in a way that reflects the range of concerns of citizens and communities and all living conditions in Québec, so that the differences between the rural and urban areas and the situation of Native communities are taken into account” (section 8).

Canada was assessed as partially meeting the criterion because Canada’s legislative requirements are somewhat more ambiguous. The *Canadian Environmental Protection Act* states that the government must monitor environmental quality (section 44), the *Department of the Environment Act* requires the Minister to “initiate, recommend an undertake programs and coordinate programs of the Government of Canada that are designed... to provide to Canadians environmental information in the public interest”

(section 5(a)), and the *Federal Sustainable Development Act* requires that a progress report on the implementation of the Federal Sustainable Development Strategy be tabled at least once every three years. However specific guidance on what should be reported on is not enshrined in law. While the reporting requirements under these laws could be fulfilled in other ways, the Canadian Environment Sustainability Indicators program was developed in response to these legislative requirements³.

5.3.5. Independent progress monitoring

Evaluation criterion 4 assesses whether the government has mandated an independent agency, such as an auditor general or an independent environmental commissioner, to monitor environmental sustainability progress. The findings are presented in Table 14, which is based on the data in Appendix.

None of the comprehensive environmental sustainability reports were published by independent agencies. Of the jurisdictions that publish a report, most were produced by the departments or ministries of environment, with contributions from other related departments (i.e. British Columbia, Alberta, Saskatchewan, Quebec, Prince Edward Island, Yukon, and Northwest Territories). An inter-departmental working group prepared Nova Scotia's report, and several departments in conjunction with provincial and territorial government departments prepared Canada's report.

Most of the jurisdictions (10) receive high scores for evaluation criterion 4b. For the most part, the auditor general for each government consistently audits performance on important environmental issues in that jurisdiction. The British Columbia Progress Board, Manitoba's Clean Environment Commission and the Environmental Commissioner of Ontario are three other bodies that perform environmental sustainability performance monitoring for their respective governments, to varying degrees.

³ "CESI is the prime instrument to measure progress of the Federal Sustainable Development Strategy and responds to Environment Canada's commitments under the *Canadian Environmental Protection Act* and the *Department of the Environment Act* to report to Canadians on the state of the environment." (Environment Canada, 2011, "About the Canadian Environmental Sustainability Indicators")

Table 5.7. Findings for Evaluation criterion 4 on whether there is environmental sustainability performance monitoring performed by an independent agency in each jurisdiction.

<i>Best practice evaluation criterion 4</i>	Monitoring and Reporting						
	BC	AB	SK	MB	ON	QC	NB
4a. Is the environmental sustainability monitoring report prepared by an independent agency?	○	○	○	○	○	○	○
	NS	PEI	NL	YT	NWT	NU	CAN
	○	○	○	○	○	○	○
4b. Is environmental sustainability performance monitoring performed by an independent agency?	BC	AB	SK	MB	ON	QC	NB
	●	●	●	●	●	●	●
	NS	PEI	NL	YT	NWT	NU	CAN
	●	○	●	○	○	○	●

Legend – 4a

- - Fully met.
- - Not met.

Legend – 4b

- - Fully met. An independent agency performs regular progress monitoring on a breadth of environmental sustainability issues.
- - Largely met. An independent agency performs progress monitoring on a breadth of environmental sustainability issues but not on a regular basis
- - Partially met. An independent agency performs monitoring on a limited number of environmental sustainability issues.
- - Not met. There is no environmental sustainability progress monitoring by an independent agency.

The frequency and breadth of environmental sustainability audits varies quite considerably between jurisdictions. For example, since 2005, the Newfoundland and Labrador Office of the Auditor General has published 40 audits and follow-up reports on environmental sustainability matters, the federal Commissioner of Environment and Sustainable Development has published 52, while the Auditor General of Saskatchewan has published 19, The Auditor General of Ontario has published 17 and the Auditor General of Nova Scotia has published 9.

Prince Edward Island, the Yukon Territory and the Northwest Territories were assess as “partially met” due to the limited breadth and frequency assessed by the independent agencies in each jurisdiction. Nunavut, which is audited by the Auditor General of Canada, has yet to be audited on any matter related to environmental sustainability. Complete lists of environmental sustainability monitoring reports published by these independent agencies are available in Appendix for each jurisdiction.

5.3.6. Environmental categories covered in the report

The fifth best practice evaluation criterion for monitoring is that the monitoring report should include a comprehensive set of environmental indicators. The findings are in Table 15, which are based on data in Appendix.

Table 5.8. Findings for evaluation criterion 5 on the proportion of environmental categories included in the jurisdictions’ environmental sustainability monitoring report.

<i>Best practice evaluation criterion 5</i>	Monitoring and Reporting						
	BC	AB	SK	MB	ON	QC	NB
5. What proportion of the 42 environmental categories is included?	33% 14/42	33% 14/42	43% 18/42	55% 23/42	-	33% 14/42	7% 3/42
	NS	PEI	NL	YT	NWT	NU	CAN
	7% 3/42	31% 13/42	-	21% 9/42	26% 11/42	-	57% 24/42

This evaluation criterion addresses the comprehensiveness of the provincial, territorial and federal reports, based on reporting relative to a set of 42 environmental categories for Canada developed by Gunton *et al.* (2006). The results range from 7% covered by New Brunswick and Nova Scotia’s reports to 57% covered by the federal government’s CESI report. Reports that included all three pillars of sustainable development (economy, society and environment), such as Quebec and Nova Scotia, tended to include fewer environmental indicators than others that focused on only environmental sustainability. Manitoba however, reported on all three pillars and is tied for most environmental categories covered. The Yukon and Northwest Territories scored

low for this criterion, perhaps due to their inclusion of many jurisdiction-specific indicators, reflecting the unique environmental sustainability challenges of the Northern environment.

In order to provide a complete and comprehensive indication of environmental sustainability within a jurisdiction, information on many aspects of the environment should be measured and reported on. By leaving out major components of the environment, stakeholders cannot assess overall environmental sustainability and may be left with a biased or poor understanding of overall performance. Canadian governments can improve their reporting practices by provided a greater breadth of indicators in their reports.

5.3.7. 5.3.7 Indicators assessed relative to targets

The sixth best practice evaluation criterion for monitoring assesses whether the monitoring report includes targets for each indicator. The findings are in Table 16, which is based on the data in Appendix.

Table 5.9. Findings for evaluation criterion 6 on the proportion of indicators assessed relative to targets, trends and comparable jurisdictions.

<i>Best practice evaluation criterion 6</i>	Monitoring and Reporting						
	BC	AB	SK	MB	ON	QC	NB
6. What proportion of the indicators is assessed relative to targets?	3% 1/35	33% 13/40	0% 0/17	9% 4/45	-	25% 26/104	42% 5/12
	NS	PEI	NL	YT	NWT	NU	CAN
	100% 16/16	46% 16/35	-	18% 4/22	3% 2/69	-	9% 5/54

Targets provide important information on acceptable performance levels and management goals for key issues. Without providing a target, it is difficult to assess whether performance in an area of interest is acceptable and whether it is improving at a rate in line with societal expectations.

Unfortunately, very few targets are included in environmental sustainability monitoring reports in Canada. Results for Canadian jurisdictions range from including no

performance targets at all (Saskatchewan) to the best performers, which have included 13 to 26 targets (Alberta, Quebec, Nova Scotia, and PEI). Most of the environmental targets included in reports are objectives for air quality such as achieving the Canada-Wide Standards for Particulate Matter and Ozone. Targets for greenhouse gas emissions are also commonly included, reflecting the public interest and pressure to set and monitor achievable targets in this area. Notably, Nova Scotia provided a target for all of the indicators by defining the overall target for environmental performance as being equal to or above the average Canadian performance (Nova Scotia, EGSPA, section 4(1)).

Targets provide a context for performance and establish societal expectations for government to achieve. This is reflected by the fact that targets are more likely to be used for those issues with high public interest (air quality and GHG emissions). Including more targets in public monitoring reports should enhance progress and communication on sustainable development. This is an important area for improvement for all jurisdictions. It should be noted that targets should also be set at levels to achieve environmental sustainability. The targets were not evaluated relative to this criterion because of the inability to define what is a sustainable target.

5.3.8. Indicators assessed relative to trends

Evaluation criterion 7 is the percentage of indicators in the monitoring report that is assessed relative to trend information. The findings are presented in Table 16, which is based on the data in Appendix.

Table 5.10. Findings for evaluation criterion 7 on the proportion of indicators assessed relative to trends.

<i>Best practice evaluation criterion 7</i>	Monitoring and Reporting						
	BC	AB	SK	MB	ON	QC	NB
7. What proportion of the indicators is assessed relative to trends?	57% 20/35	82% 33/40	88% 15/17	87% 39/45	-	77% 80/104	67% 8/12
	NS	PEI	NL	YT	NWT	NU	CAN
	94% 15/16	91% 32/35	-	45% 10/22	65% 45/69	-	76% 41/54

Providing trend information was the most common way that governments provided context for evaluating environmental sustainability progress (targets and comparable jurisdictions are other ways). Trend information was included, by reporting jurisdictions for between 45% and 94% of environmental categories, with most reporting jurisdictions (7) reporting trends for more than 70% of indicators. For the majority of reporting jurisdictions, trend information was included for every indicator that covered an environmental category (i.e. Alberta, Saskatchewan, Quebec, Nova Scotia and the Northwest Territories).

5.3.9. Indicators assessed relative to other jurisdictions

Evaluation criterion 8 assesses whether the indicator findings are compared to other, comparable jurisdictions. The findings are presented in Table 18 and are based on data in Appendix.

Table 5.11. Findings for evaluation criterion 8 on the proportion of indicators assessed relative to comparable jurisdictions.

<i>Best practice evaluation criterion 8</i>	Monitoring and Reporting						
	BC	AB	SK	MB	ON	QC	NB
8. What proportion of the indicators is assessed relative to comparable jurisdictions?	9% 3/35	10% 4/40	12% 2/17	20% 9/45	-	4% 4/104	0% 0/12
	NS	PEI	NL	YT	NWT	NU	CAN
	100% 16/16	3% 1/35	-	18% 4/22	23% 16/69	-	28% 15/54

Comparing results to other jurisdictions, or benchmarking, gives context to performance information and provides incentives for governments for continuous improvement in order to maintain or improve their rank. Most reports include at least some benchmarking, but this practice could be improved upon by almost all reporting jurisdictions.

Nova Scotia and the federal government are the only jurisdictions to consistently use benchmarking to assess performance. These reports provided 16 and 15 indicators, respectively, that included benchmark information. Nova Scotia's EGSPA goal of

achieving a level of environmental performance relative to the Canadian average compels the province to report relative to other jurisdictions for every indicator. The Canadian Environmental Sustainability Indicators feature comparisons to international cities for indicators such as urban air quality, and to countries throughout the world for indicators such as air pollutant emissions and protected areas.

Other reports include rankings for some indicators, often simply providing an in-text ranking for that indicator amongst Canadian provinces and territories, or the national average. Some provinces and territories use information from other countries in order to provide a more meaningful comparison. For example, the NWT report compares the results for some wildlife indicators to those in other Northern regions, such as Scandinavia, Northern Russia and Alaska.

Benchmarking provides information that is easily interpreted by stakeholders and incentivizes continuous performance improvement in order to maintain or improve in rankings. Given that many of the indicators used by Canadian jurisdictions are compiled using data from national monitoring programs, providing benchmark information relative to other provinces and territories is a simple and feasible way of giving contextual performance information and encouraging continuous performance improvement.

5.3.10. Adaptive Management

Evaluation criterion 9 assesses whether the government has established a formal mechanism for adaptive management. This is addressed by asking whether there exists a mandatory review and revision of the jurisdiction's environmental sustainability planning system in order to address deficiencies identified through monitoring. The findings are presented in Table 20, which is based on data available in Appendix.

Table 5.12. Findings for evaluation criterion 9 on where there is a mandatory review and revision of the jurisdiction’s environmental sustainability planning system based on the monitoring results.

<i>Best practice evaluation criterion 10</i>	Adaptive Management						
	BC	AB	SK	MB	ON	QC	NB
10. Is there a mandatory review and revision of the jurisdiction’s environmental sustainability strategy based on the monitoring results?	○	●	○	○	●	●	○
	NS	PEI	NL	YT	NWT	NU	CAN
	○	○	○	○	○	○	●

Legend

- - Fully met. The government has a clearly articulated process for mandatory review and revision of the province’s environmental sustainability strategy based on the monitoring result.
- ◐ - Partially met. The government has articulated a process for, or intention to, reviewing certain strategies based on monitoring results but there is no mandatory requirement to address deficiencies identified during monitoring.
- - Not met. The government does not have a clear process for mandatory review and revision of the province’s environmental sustainability strategy based on the monitoring result.

No Canadian government has established a mandatory review process to address deficiencies identified in monitoring. However, Alberta, Ontario, Quebec and Canada have each articulated a commitment to review and revise their environmental sustainability strategy based on monitoring results and were therefore assessed as partially meeting the criterion. Most commonly, these governments have articulated an intention to review their sustainability strategies after a given period of time to ensure they are still relevant and to adapt them to the changing management circumstances and priorities.

For Alberta, the Land-use Framework (2008) states that the framework “will be based on a system for continuous improvement. Plans and actions may be adjusted and incorporate new technology or new information. If there are unintended negative consequences, Cabinet may correct or repeal provincial policy as needed” (p. 39).

Our Sustainable Future (2005), a report from the Ontario Ministry of Natural Resources expressing long-term strategic directions and priorities, states that “A system of monitoring, assessment and reporting will help to gauge our progress, and in the spirit

of adaptive management, we will use this information to alter our management approaches or modify our strategies and actions in order to achieve results. Public reporting will ensure that we are transparent and accountable for results” (p. 20).

Quebec’s Sustainable Development Strategy 2008-2013 states that in order to produce periodic reviews of the strategy, the government will establish a mechanism “permettant de faire le lien entre les résultats atteints par les ministères et les organismes, les objectifs de la stratégie et la progression du développement durable au Québec mesurée à l’aide des indicateurs de développement durable” [permitting a link to be made between the results achieved by the departments and agencies, the objectives of the strategy and sustainable development progress in Quebec measured using indicators of sustainable development] (p. 56).

For the federal government, the Minister of the Environment is charged with producing a new Federal Sustainable Development Strategy once every three years. However there is no mandatory requirement that the new strategy address deficiencies identified in progress monitoring. The Office of the Commissioner of Environment and Sustainable Development provides recommendations for improvement. The updated strategy may take into consideration these recommendations, however, it is not a mandatory requirement. The FSDS policy uses a “Plan, Do, Check, Improve” system, which supports an adaptive management approach.

5.3.11. Summary of Evaluation Results

For the most part, the federal, provincial and territorial governments of Canada regularly produce environmental sustainability monitoring reports that cover a breadth of environmental issues and contain important trend information. As illustrated in figure 2, there are several key areas in which few government meet best practice criteria and where there is significant opportunity for improvement, namely including targets and benchmarking, establishing a clear mandate for reporting, publishing a comprehensive set of environmental sustainability indicators and establishing a mandatory process for the review and revision of the environmental sustainability planning system based on monitoring results.

The following table presents a summary of the evaluation findings for the provincial, territorial and federal governments for the ESP best practice criteria for monitoring and adaptive management. In order to facilitate inter-jurisdictional comparisons, an overall score was calculated for each jurisdiction. In order to quantify the qualitative scores a numerical value between 1-100 was assigned to each (not met = 0, partially met = 50, largely met= 75 and fully met = 100). Each best practice criterion was added together and divided by the total number of criteria (criteria 4a and 4b were averaged to give a score for criterion 4). Each criterion was weighted equally.

Table 5.13. Summary of evaluation results.

<i>Best practice evaluation criteria</i>	BC	AB	SK	MB	ON	QC	NB	NS	PEI	NL	YT	NWT	NU	CAN
Best Practice – Monitoring														
1. Is monitoring information available in a comprehensive report and/or website?	● Website	● Website	● Report	● Report	◐ Partial	● Website	● Report	● Report	● Report	◐ Partial	● Report	● Website	◐ Partial	● Website
2. Is there a regular public monitoring report measuring sustainability progress?	● Online	● Online	● 2013	● 2009	○ None	● Online	○ 2003	● 2011	● 2010	○ None	● 2013	● 2009	○ None	● Online
3. Is there a clear mandate for regular environmental sustainability reporting?	○	●	●	●	○	◐	○	○	○	○	●	○	○	◐
4a. Is the environmental sustainability monitoring report prepared by an independent agency?	○	○	○	○	○	○	○	○	○	○	○	○	○	○
4b. Is environmental sustainability performance monitoring performed by an independent agency?	●	●	●	●	●	●	●	●	◐	●	◐	◐	○	●
5. What proportion of the 42 environmental categories is included?	33% 14/42	33% 14/42	43% 18/42	55% 23/42	-	33% 14/42	7% 3/42	7% 3/42	31% 13/42	-	21% 9/42	26% 11/42	-	57% 24/42
6. What proportion of the indicators is assessed relative to targets?	3% 1/35	33% 13/40	0% 0/17	9% 4/45	-	25% 26/104	42% 5/12	100% 16/16	46% 16/35	-	18% 4/22	3% 2/69	-	9% 5/54

<i>Best practice evaluation criteria</i>	BC	AB	SK	MB	ON	QC	NB	NS	PEI	NL	YT	NWT	NU	CAN
7. What proportion of the indicators is assessed relative to trends?	57% 20/35	82% 33/40	88% 15/17	87% 39/45	-	77% 80/104	67% 8/12	94% 15/16	91% 32/35	-	45% 10/22	65% 45/69	-	76% 41/54
8. What proportion of the indicators is assessed relative to comparable jurisdictions?	9% 3/35	10% 4/40	12% 2/17	20% 9/45	-	4% 4/104	0% 0/12	100% 16/16	3% 1/35	-	18% 4/22	23% 16/69	-	28% 15/54
Best Practice – Adaptive Management														
9. Is there a mandatory review and revision of the jurisdiction's environmental sustainability strategy based on the monitoring results?	○	●	○	○	●	●	○	○	○	○	○	○	○	●
Overall Score (%)	39	62	55	55	17	54	30	61	44	11	45	35	11	58

LEGEND

Criterion 1	<ul style="list-style-type: none"> ● - Fully met. Monitoring information is made publicly available in a comprehensive report and/or website ● - Partially met. Monitoring information is made available but there is no single, comprehensive point of access to that information. ○ - Not met. Monitoring information is not made publicly available
Criterion 2	<ul style="list-style-type: none"> ● - Fully met. The government has published a report within the past 3 years ● - Largely met. The government has published a report within the past 5 years ● - Partially met. The government has published a report within the past 7 years ○ - Not met. The government has not published a report within the past 7 years
Criterion 3	<ul style="list-style-type: none"> ● - Fully met. The government has made a legislated commitment to publishing a report on a regular basis, at least once every 3 years ● - Largely met. The government has made a policy commitment to publishing a report on a regular basis, at least once every 3 years ● - Partially met. The government has committed to publishing a report on a regular basis, however the frequency for reporting is not defined, or is less than once every three years ○ - Not met. The government has no clear mandate or schedule for reporting

Criterion 4	<p><u>Legend – 4a</u></p> <ul style="list-style-type: none"> ● - Fully met. ○ - Not met. <p><u>Legend – 4b</u></p> <ul style="list-style-type: none"> ● - Fully met. An independent agency performs regular progress monitoring on a breadth of environmental sustainability issues. ● - Largely met. An independent agency performs progress monitoring on a breadth of environmental sustainability issues but not on a regular basis ● - Partially met. An independent agency performs monitoring on a limited number of environmental sustainability issues, or environmental issues are not address regularly. ○ - Not met. There is no environmental sustainability progress monitoring by an independent agency.
Criterion 9	<ul style="list-style-type: none"> ● - Fully met. The government has a clearly articulated process for mandatory review and revision of the province’s environmental sustainability strategy based on the monitoring result. ● - Partially met. The government has articulated a process for, or intention to, reviewing certain strategies based on monitoring results but there is no mandatory requirement to address deficiencies identified during monitoring. ○ - Not met. The government does not have a clear process for mandatory review and revision of the province’s environmental sustainability strategy based on the monitoring result.

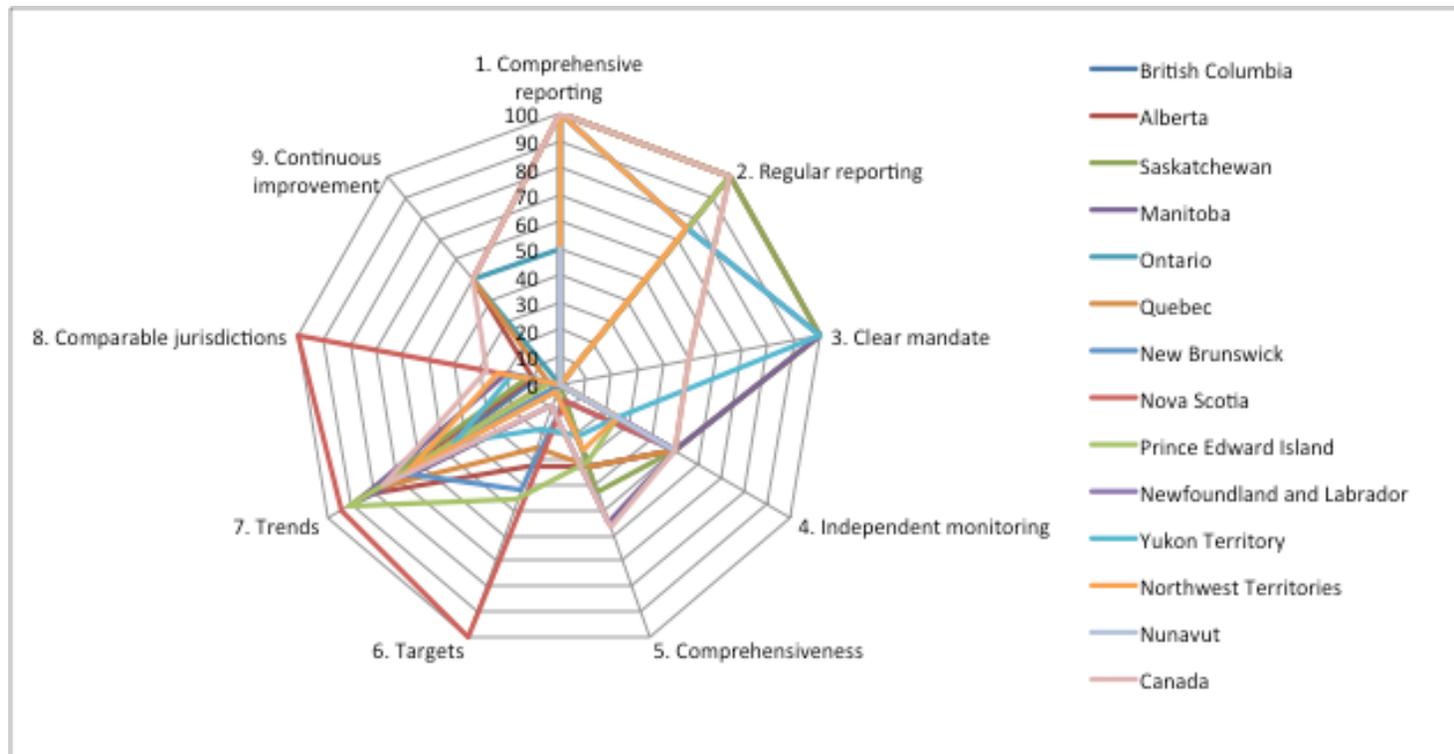


Figure 5.1. A radar graph showing the evaluation results for monitoring and adaptive management for the provincial, territorial and federal governments.

Chapter 6.

Recommendations, Discussion and Conclusion

Overall, the study found that most Canadian provinces, territories and the federal government regularly report on progress towards environmental sustainability using indicators. However, there are several deficiencies in reporting practices that limit the potential effectiveness and influence of the reports. Most notably, a lack of comprehensive indicator sets, limited reporting relative to targets and comparable jurisdictions, and few commitments to revising sustainability plans and strategies based on monitoring results.

This chapter features recommendations for addressing these deficiencies (recommendations 1-4) as well as recommendations aimed at improving the effectiveness and accessibility of reporting across Canada, such as increased use of online reporting platforms and increased inter-jurisdictional harmonization of reporting practices (recommendations 5-6).

6.1. Recommendations and Discussion

Based on a review and evaluation of the environmental sustainability reporting practices in Canada, the following six recommendations are offered to address deficiencies and capitalize on opportunities for improvement:

1. Governments should regularly produce a comprehensive environmental sustainability report.
2. Governments should ensure comprehensive reporting by using a breadth of environmental sustainability issues.
3. Indicators should be reported against targets, trends and benchmarks to enable performance assessment.

4. Monitoring results should be used to revise plans and strategies
5. Governments should provide web-based reporting.
6. Governments should consider harmonizing reporting practices.

The importance of addressing these deficiencies and the benefits of adopting the recommendations are discussed in the following sections.

6.1.1. Government should regularly produce a comprehensive environmental sustainability report.

In order to meet best practices for environmental sustainability reporting, the governments of Ontario, New Brunswick, Newfoundland and Labrador, and Nunavut should publish a comprehensive environmental sustainability monitoring report, and the governments Manitoba and the Northwest Territories must update their environmental sustainability reporting more regularly.

There may be several reasons as to why these governments are unable to regularly publish a comprehensive environmental sustainability report. Firstly, in some jurisdictions, a lack of political or administrative will may hinder regular reporting. A legislated reporting mandate could help to ensure that resources are available for developing and maintaining a reporting program over the long term. Presently, six Canadian jurisdictions have established a legislated environmental sustainability reporting mandate (see section 5.3.3.7). Some of the elements of legislated reporting mandates in Canada include reporting on the state of the environment, the frequency and timing of reporting, how the report is to be tabled, published or otherwise made accessible, and how indicators are to be selected, including selection criteria. In addition to a legislated mandate, an improved understanding of the benefits of reporting, particularly those experienced by key stakeholder groups, could bolster the political will for reporting. One of the recommendations for future research identified in this study is research into the uses and perceived benefits of environmental sustainability information by key stakeholder groups.

Secondly, there may be a lack of funding for producing comprehensive environmental sustainability reports, as they often involve significant effort in the

development stages of a reporting approach, as well as continued efforts to ensure the information is up-to-date. This problem may be the case for the Yukon, where despite having a firm legislated mandate for annual reporting, the government has been unable to meet the legislated commitment. From 1999 to 2011, the Yukon was Canada's most consistent reporter, publishing a state of the environment report for every year from 1999 to 2008, as per its legislated mandate. Reporting however fell behind over time (the 2003 report was published in 2007, and the 2008 report in 2011), and 2008 is the last time a comprehensive report was published (two interim reports were published in 2012 and 2013). In order to reduce the costs of reporting, government should consider moving to an online reporting platform. While upfront costs may be significant, the long term maintenance through website updating may be considerably less than developing and publishing new reports each year. Additionally, increased use of existing indicator data as well as some harmonization efforts may help to reduce reporting costs.

Thirdly, many governments have published ad hoc regional and issue-specific reports, such as reports on forests, watersheds, aquatic ecosystems, wildlife, waste management, and drinking water quality. These governments may conclude that these reports, when taken together, present a comprehensive view of environmental sustainability within the jurisdictions. While these provide important information to a specific audience, comprehensive environmental sustainability reporting provide stakeholders with a single-access point to reliable, up-to-date and comprehensive information on the environment.

6.1.2. Governments should ensure comprehensive reporting by using a breadth of environmental sustainability issues.

In order to ensure a more complete understanding of environmental sustainability across Canada, jurisdictions must improve the comprehensiveness of their reporting. For the most part, reporting jurisdictions do well in covering a few areas of key public interest such as air and water quality (both drinking and surface water). Other areas are covered by only some of the reports. These include indicators in the natural resource consumption group (energy consumption, renewable energy, and water consumption), the waste generation and treatment group (waste generation and recycling), air emissions other than greenhouse gases (despite the availability of NPRI data), and the

protecting nature group (species at risk, protected areas and forestry). Most other indicators were reported on by only a few jurisdictions. These include agricultural practices (pesticide and fertilizer use), fisheries, transportation, sewage treatment, VOCs, energy efficiency, and hazardous waste.

The 42 environmental categories, used in the evaluation to assess the comprehensiveness of reporting practices, represent a general set of environmental sustainability indicators for Canada (Gunton *et al*, 2006). They cover major environmental issues faced by Canadian jurisdictions; however, some categories may be of greater interest to a given jurisdiction than others, depending on the characteristics of the environment, economy and society. While inter-jurisdictional differences in indicator reporting is appropriate, there is a great discrepancy in the comprehensiveness of reporting practices across the country. As discussed in sections 6.1.6.1, developing a core set of indicators based on areas of mutual interest would benefit harmonization efforts.

6.1.3. Governments should report against targets, trends and benchmarks to enable performance assessment.

Trends, targets and inter-jurisdictional comparisons (benchmarking) provide contextual information that enables the user to understand and assess performance. This information also provides governments and stakeholders with incentive to take action in order to improve a trend, meet a target, or compare favourably to peer performance. Furthermore, it helps to ensure that reporting is transparent while reducing bias. There may be a tendency to over-emphasize desirable findings, while minimizing emphasis on shortcomings or failures. Through the use of benchmarks, targets and trends, this bias is reduced.

Environment Canada's research into the preferences and perceptions of intended CESI user groups revealed how important this information is to users. Their research found overwhelming support for trend information and benchmarking. The user groups felt that it was "very important" to see how Canada compares to other countries in order to identify best practices, opportunities for cooperation, establish benchmarks and standards, create national pride, enhance credibility and accountability, and underscore global interconnectedness (Environment Canada, 2008).

Governments have established many targets, standards and guidelines for environmental performance. There are many more targets and standards for every government than those that are reported on, illustrating a missed opportunity to report against this important information. Similarly, information on the performance of other comparable jurisdictions is readily available for many environmental indicators. Provinces and territories use many national data sets and methodologies for their indicators and, particularly for these indicators, they should include the performance information for other provinces and territories in their report. While some do, only the federal government scored above 10% (19%) for this criterion. In fact, the federal government provides provincial and territorial data for nearly all of its indicators. However, these inter-jurisdictional comparisons did not contribute to Canada's evaluation score. The 19% of indicators that make up Canada's score all featured international performance comparisons. The fact that Canada scores best despite having to work with the statistical and data collection methods used by other countries around the world, illustrates the feasibility for provincial and territorial governments to improve their practices in this regard.

6.1.4. Monitoring results should be used to revise plans and strategies

One of the purposes of environmental sustainability reporting is to improve government performance. In order for environmental information to improve performance it must be incorporated into the appropriate decision-making processes. The iterative use of monitoring information to revise plans and programs is a critical component to a continuous improvement process and is part of a larger process for adaptive management.

Overwhelmingly, Canadian governments did not meet this best practice criterion. Only four jurisdictions have articulated a process for the revision of their environmental planning system based on monitoring results, and none of them have developed a mandatory requirement. This deficiency in process was also noted in the 2009 evaluation of CESI (Environment Canada, 2009). The evaluation found "no evidence [...] that CESI products are actually being used [by government], except by Treasury Board in its annual *Canada's Performance* reports and by Human Resources and Social

Development Canada in its set of human well-being indicators. Attention is needed with respect to [...] the integration of CESI results in policy decisions” (Environment Canada, 2009, page 14).

6.1.5. Government should provide web-based reporting

An obvious trend in environmental sustainability reporting is the growing use of an online platform for reporting. Online reports present numerous opportunities and advantages including the opportunity to continuously update information and more flexibility to coordinate updates with monitoring programs, access to downloadable data and details on methodology, information at different scales (from local to international), links to other webpages, and platforms for customizations and graphic creation. Further, online information may be more accessible to certain user groups, and can be searchable and linked to by media and other online information sources. In general, the online format for reporting better reflects the dynamic and iterative process of environmental management.

Previous environmental sustainability reporting efforts were communicated from a highly scientific perspective, making these efforts less accessible to Canadians (Environment Canada, 2008). For example, *Environment Trends in BC (2007)* was a 352-page report consisting of seven ‘technical papers’. Environment Canada research into the preferences and perceptions of intended CESI user groups revealed that users prefer more common language, up to date information (<2 years old), access to data at more specific levels (drill-down capacity), more trend information, and better integrated socio-economic and health context information (Environment Canada, 2008, 2009). Environment Canada also found that customer satisfaction increase significantly when government service are accessed through the web (Environment Canada, 2008).

Reflecting the changing demands of information users, the Standing Committee on Environment and Sustainable Development echoes this recommendation in its review of CEPA, recommending that comprehensive state of the environment reporting “should be reinstated in a manner suitable to today’s technology that gives access to the data as well as analysis.” (Standing Committee on Environment and Sustainable Development, 2007, p. 8).

6.1.6. Governments should consider harmonizing reporting practices

Due to the constitutional division of powers over environmental matters, including areas of overlapping jurisdiction, provincial, territorial and federal governments must coordinate and collaborate in almost every area of environmental governance. This includes in the collection, analysis and dissemination of environmental information. There are many opportunities for increasing the harmonization of reporting practices in Canada and harmonization has the potential to improve environmental sustainability reporting in several areas. The benefits of harmonization include more efficient use of the limited resources afforded to reporting programs, increased accessibility to users, enhanced consistency of information which benefits comparability and data presentation, and identifying new ways to encourage the application of “state of the environment” information by decision makers (CCME, 1995a).

There have been previous efforts to harmonization environmental sustainability reporting approaches across Canada. In the early 1990s, state of environment reporting was being developed in Canada as governments and citizens recognized the need for more and better environmental information. At that time, the CCME convened a State of the Environment Reporting Task Group to identify needs and opportunities to harmonize activities related to state of environment reporting, and to develop a common set of indicators (CCME, 1995a). The State of the Environment Reporting Task Group produces two key documents to guide harmonization efforts: the State of Environment Reporting Harmonization Strategy (CCME, 1995a) and the State of the Environment Reporting Guidelines for CCME Member Jurisdictions (CCME, 1995b). The strategy promotes ongoing communication, shared understanding of the components of reporting, common approaches to agreed elements, cooperation with respect to sharing resources and developing tools and flexibility in meeting the needs of each jurisdiction. At that time, the CCME identified a sequence of harmonization benefits that Canadian jurisdictions could expect: greater consistency leading to improved understanding, greater acceptance, enhanced access to increased credibility and finally, increased application (CCME, 1995a).

However, despite these early efforts, the reporting practices of federal, provincial, and territorial governments are notably different in terms of mandate, purpose, audience,

organization and indicator use (as described in Chapter 4 and evaluated in Chapter 5). As noted by Environment Canada during the development of the CESI initiative, “shifting and unsustainable reporting practices over the past 20 years have failed to inform Canadians and provide consistent information over time” (Environment Canada, 2008, slide 4).

The harmonization benefits listed above, although identified almost two decades ago, continue to represent relevant opportunities today. Opportunities to harmonize this emerging approach across Canadian jurisdictions include:

- Developing a core set of environmental sustainability indicators
- Developing a common approach to reporting including a shared understanding of the purpose and objectives of reporting and the intended audience

The benefits of harmonization of these aspects of reporting are described in the following sections.

Develop a core set of environmental sustainability indicators

Presently, there is a great diversity in the number, breadth and type of indicators that are reported on by Canadian jurisdictions. A core set of indicators to be reported on across the country would provide a minimum level of comprehensiveness for environmental reporting, increase consistency, focus and synergize reporting efforts, and enhance inter-jurisdictional comparability and benchmarking. The core set of indicators would address issues of common concern, and would likely cover many of the same environmental categories used in this report to evaluate reporting practices.

The CCME member jurisdictions agreed to develop a core set of environment indicators as part of the 1995 Harmonization strategy (CCME 1995a). Despite the lack of consistency in indicator use across jurisdictions, as revealed in this study, there are many indicators that could be easily adopted by jurisdictions across Canada. Indeed, the CCME has developed several useful environmental indicators that are reported against by many Canadian jurisdictions. Alberta, Saskatchewan, Manitoba, and the Yukon report against the CCME’s Air Quality Index. British Columbia, New Brunswick, Prince Edward Island, and the Yukon report against the Canada-Wide Standards for Particulate Matter

and Ozone. Manitoba, Yukon and Canada use the Water Quality Index. However, only British Columbia reports against these CCME Water Quality Guidelines for the Protection of Aquatic Life in their environmental sustainability report. Additional examples of Canada-wide indicators developed by other organizations include Health Canada's Drinking Water Quality Guidelines (DWQG) and National Ambient Air Quality Objectives (NAAQOs), the general status of species reports (Federal, Provincial and Territorial Governments of Canada, 2010), and the Canadian Council of Forest Ministers' National Forest Inventory program.

To complicate matters, many jurisdictions have developed their own measurements and employ these in their reports. New Brunswick and British Columbia report against domestic air quality objectives and Alberta reports against the Alberta River Quality Index. Instead of reporting against the Canada-Wide Standards for Particulate Matter and Ozone, Quebec (the only Canadian jurisdiction that is not a signatory to the Canada-Wide Accord on Environmental Harmonization) reports on annual percentage of days without smog. Similarly, Canada does not report against the Health Canada Water Quality Guidelines but instead on drinking water advisories, presumably due to the direct link to the policy issue. Additionally, some commonly used indicator categories, such as energy consumption, water consumption and recycling, are reported on very differently across the country. Recycling for instance is reported on in the following ways, by various jurisdictions: household recycling, proportion of material recycled, waste recycled or reused, residual materials recovery and reclamation rate, and beverage containers recycled.

The core set of indicators should reflect the objectives of other inter-jurisdictional policy initiatives, including joint federal/provincial/territorial priority setting and mutually agreed upon environment outcomes. For example, under the Canada-wide Environmental Standards Sub-agreement, "environmental sustainability indicators will be established where applicable to provide benchmarks for monitoring and reporting on the attainment of agreed-upon Canada-wide Environmental Standards" (CCME, n.d., page 6). Areas of mutual interest might include priority policy areas and cross-jurisdictional issues with readily available and consistent data (ex. air emissions, household waste diversion, general status of species, etc.).

While there are several benefits to establishing a core set of indicators, it is important that provinces and territories continue to report on local, regional and jurisdiction-specific concerns in order to provide users with information tailored to their needs and interests. CESI user groups identified the provision of local and regional information as a priority for reporting in Environment Canada's public opinion research (Environment Canada, 2008). This need is well represented by looking at the differences in indicator reporting for fisheries harvest indicators used by Manitoba and the Northwest Territories. Where Manitoba reported on the levels of commercial fish harvest versus MSY estimates for Lake Winnipeg, NWT reported on the percentage of groups (Inuit, Dene, Métis and non-native) involved in subsistence and recreational fishing. Both indicator approaches reflect the unique challenges and interests involved in fisheries harvest for the reporting jurisdiction. In this spirit, a core set would be applied across jurisdictions and would be complemented by jurisdiction-specific indicators reflecting local and regional differences.

Develop a common approach to reporting including a shared understanding of the purpose and objectives of reporting, the intended audience, and the use of a common conceptual framework

This study illustrates the significant divergence in reporting practices across Canada. At the same time, there are some emerging trends in reporting that reflect new practices and approaches being adopted by different jurisdictions. In order to facilitate access to comprehensive, authoritative information on environment sustainability across Canada, government should consider harmonizing some of the fundamental aspects of reporting to create a coherent, national approach. Three aspects that governments should consider harmonization are in the development of shared statements on the reporting purpose and objectives, in the identification of the intended audience, and in the use of a common conceptual framework.

A shared understanding of the purpose and objectives of reporting

Purpose and objective statements can provide the foundation for harmonization efforts and aid governments in the efficient design and production of environmental sustainability reports. The development of a shared purpose statement would be an essential first step in creating common and consistent reporting practices across the country.

The purpose statements of those reporting jurisdictions that provided one (Saskatchewan, Manitoba, Quebec, Prince Edward Island, Yukon, Northwest Territories), feature several common elements. These common elements are: to measure progress towards sustainability (Quebec, Prince Edward Island, Yukon, Canada); to inform the public (Saskatchewan, Manitoba, Quebec, Prince Edward Island, Yukon, Northwest Territories, Canada); to identify emerging issues and trends (Saskatchewan, Yukon); and to aid in decision-making (Quebec, Yukon, Northwest Territories).

The 1995 CCME Harmonization Strategy and Harmonization Guidelines provide a shared purpose statement agreed upon by all member jurisdictions:

The purpose of state of environment reporting is to provide timely, accurate and accessible information on ecosystem conditions and trends, the significance of these conditions and trends and societal responses. This information will increase public understanding and education, and assist priority setting and decision-making about matters related to the environment by providing objective and scientifically valid information. The information should also establish linkages between environmental conditions and socio-economic factors, reflecting the holistic and integrative nature of the relationship that exists between humans and the environment. (CCME, 1995a, 1995b)

This statement, along with the convergence in the purpose statements outline above, provides a basis for governments to develop a renewed vision and purpose for environmental sustainability reporting across Canada.

Establishing the intended audience

Since the state of environment reporting of the 1990s, there has been a discernable shift in the intended audiences of environmental sustainability reporting. The State of the Environment reports of the 1990s and 2000s were intended to serve broad public information needs and to generally enhance public awareness of environmental issues. Reflecting this general approach, the 1995 Harmonization Strategy identified “the informed public and decision makers” as the most common audiences, along with many specific target groups including teachers, students, specialists, non-governmental organizations, businesses and the media (CCME, 1995a, p. 9). The 1995 Harmonization Strategy assessed the identification of a common audience as a low priority for harmonization (CCME, 1995a, p. 10). It seems however that the relative importance of

considering a more specific audience has increased as environmental sustainability reports have becoming increasingly policy-driven.

Reflecting a general trend towards more integrated sustainable development reporting, and performance reporting for decision makers, recent reports increasingly target policy analysts and other specialists as key audiences. Environment Canada identifies the target users of CESI to be “senior level policy makers, experts in accountability reporting, members of the general public with an interest in environmental issues, and representatives from environmental non-governmental organizations (ENGOs) and industry” (Environment Canada, 2009, p. 28).

While jurisdictions will likely find that the audience of their report varies depending on population size, active industries, key environmental issues and civil society interest, it would benefit all jurisdictions to identify common target users in order to tailor their efforts to the information needs of these groups. A clear understanding of user needs is critical because providing too much, too little or the wrong type of information to a given audience diminishes the effectiveness of reporting programs.

Choose a common conceptual framework

Another area where harmonization of reporting practices may be beneficial is in the selection of common conceptual frameworks for reporting. Harmonizing conceptual frameworks for reporting would benefit harmonization efforts in other areas, particularly indicator selection, as well as the ability of users to interpret the information and to compare performance across jurisdictions. Presently, Canadian jurisdictions use various combinations of theme-based, policy-based, DPSIR, and capital-based frameworks. British Columbia, Alberta, Saskatchewan and the Northwest Territories use a DPSIR adaptation. Quebec and Nova Scotia use a capital-based approach. Quebec, Nova Scotia and Canada use a policy-based approach. Alberta, Saskatchewan, Manitoba, PEI, Yukon, and Canada use a theme or issue-based approach.

Given the diverse approaches currently employed, it may be difficult for all jurisdictions to agree on a common conceptual framework. Theme-based and policy-based frameworks are compatible with each other as well as with both the DPSIR and capital-based approaches. The DPSIR approach and the capital-based approach are

mutually exclusive, but neither is necessary. Focusing on themes and overarching policy goals may be the most feasible approach to finding commonalities and achieving some harmonization.

6.1.7. Concluding thoughts on harmonization

Harmonization of reporting practices enhances consistency and comparability of environmental sustainability performance efforts across Canada, and contributes to other inter-jurisdiction initiatives to jointly establish environmental policy and outcomes. In their 2005 review of the Canadian Environmental Protection Act, provincial and territorial governments recommended more collaborative federal-provincial-territorial processes to improve intergovernmental cooperation and collaboration in several areas, including the development of mutually agreed upon environmental outcomes and joint priority setting (CCME, 2005). Further, they recommended that they work collaboratively to improve data on national trends in ambient environmental quality, and that the federal government should take on a larger role on national state of environment reporting and trends data and analysis (CCME, 2005). Given that the CESI report scored better than other reports in most categories in the present study, it is perhaps a good starting point for the harmonization of reporting practices throughout the country.

The results of the present study corroborate the opportunities for enhancing harmonization in ways that would benefit governments as well as users of sustainability monitoring reports. This harmonization effort is appropriate at this time in light of the new ways that environmental issues are being understood and addressed, as well as the ways in which information is being generated, accessed, and shared.

6.2. Recommendations for future research

During the course of this study, several opportunities for new research were identified. The following list of eight potential research questions, represent issues for which increased research would contribute to the overall understanding of the importance of environmental sustainability reporting in Canada as well as identify key areas and options for improvement.

1. Why are some jurisdictions unable to regularly report? What inhibits jurisdictions from meeting best practices?
2. Who are the key users (current and potential) of environment sustainability indicator information? What do they use the information for? What are their information needs and how could these needs be better met?
3. How does the government understand the benefits of reporting? Do the stated information needs of users correspond to the government's perceptions of user's needs?
4. How are other governments coordinating the development and dissemination of environment sustainability information? What are the framework used and lessons learned for coordinating information dissemination?
5. How can government capitalize on new opportunities for dissemination of environmental sustainability information (e.g. via the internet, cell phone application, interactive websites, videos, social media, etc.)?
6. How do governments use environmental sustainability indicator information to review and revise plans and strategies? To what extent does this process correspond to an adaptive management approach? How can reporting be better integrated into overall environmental management process?
7. What are some options for a new harmonized approach? What is being done in other countries to address this issue?
8. What are the similarities between public environmental sustainability reporting and corporate sustainability reporting? What lessons can be learned from corporate reporting and applied to public reporting?

6.3. Conclusion

Reliable, public information on environmental sustainability performance is essential to sustainable development. It ensures government transparency and accountability and informs decision-making and social participation. Reporting practices vary across the country and there are a variety of opportunities for improvement available to each jurisdiction. Enhancing harmonization of reporting practice provides many benefits, however improvements can be made without harmonization efforts as well. Canadian provincial, territorial and federal governments should work to provide comprehensive environmental sustainability information that includes targets, trends, and benchmarking, and contributes to improved decision-making through the revision of plans and strategies based on monitoring results. The key elements of these

recommendations are also echoed by the Standing Committee on Environment and Sustainable Development, which recommended “that the government publish biennially, in electronic and hard copy formats, a comprehensive state of the environment report to provide timely, accurate and accessible environmental information, integrated with socioeconomic factors to improve decision-making and support progress towards sustainability” (Standing Committee on Environment and Sustainable Development, 2007, p. 8).

References

Literature Cited

- Alberta Environment and Sustainable Resource Development. (2013, updated regularly). *State of the Environment*. Retrieved April 2013 from <http://environment.alberta.ca/02488.html>
- Alberta. (2008) *Land-use Framework*. Retrieved from https://www.landuse.alberta.ca/Documents/LUF_Land-use_Framework_Report-2008-12.pdf
- Ball, A., and Grubnic, S. (2007). Sustainability accounting and accountability in the public sector. In J. Unerman, J. Bebbington, & B. O'Dwyer (Eds.), *Sustainability accounting and accountability* (pp. 243–265). Oxon: Routledge.
- Barton, A. (2005). Professional accounting standards and the public sector – A mismatch. *Abacus*, 41(2), 138–158.
- Bell, D. (2002). *The Role of Government in Advancing Corporate Sustainability*. York University Sustainable Enterprise Academy. Retrieved from <http://yorkspace.library.yorku.ca/xmlui/handle/10315/2785>
- British Columbia Ministry of Environment. (2007). *Environmental Trends in British Columbia: 2007*. Retrieve from www.env.gov.bc.ca/soe/
- British Columbia Ministry of Environment. (2013). *Environmental Reporting BC*. Retrieved from: <http://www.env.gov.bc.ca/soe/>
- Canadian Council of Ministers of the Environment (CCME). (1995a). A Strategy for the Harmonization of State of Environment Reporting Across CCME Member Jurisdictions.
- Canadian Council of Ministers of the Environment (CCME). (1995b). State of the Environment Reporting Guidelines for CCME Member Jurisdictions.
- Canadian Council of Ministers of the Environment (CCME). (1996). Summary of Preceedings: CCME State of the Environment Reporting Harmonization Workshop IV. October 23-24, 1995, Winnipeg, Manitoba.
- Canadian Council of Ministers of the Environment (CCME). (n.d). Canada-wide Environmental Standards Sub-agreement. Retrieved from http://www.ccme.ca/assets/pdf/cws_envstandards_subagreement.pdf
- Canadian Council of Ministers of the Environment (CCME). (2005). Review of the Canadian Environmental Protection Act. Retrieved from: http://www.ccme.ca/assets/pdf/cepa_web_text_table_e.pdf

- Commissioner of Environment and Sustainable Development (CESD). (2000). Chapter 7 Co-operation Between Federal, Provincial and Territorial Governments. In *2000 May Report of the Commissioner of the Environment and Sustainable Development*. Retrieved from http://www.oag-bvg.gc.ca/internet/English/parl_cesd_200005_07_e_11234.html
- Commissioner of Environment and Sustainable Development (CESD). (2008a). Chapter 8 - Management Tools and Government Commitments - International Environmental Agreements. In *2008 March Status Report of the Commissioner of the Environment and Sustainable Development*. Retrieved from http://www.oag-bvg.gc.ca/internet/English/parl_cesd_200803_08_e_30134.html
- Commissioner of Environment and Sustainable Development (CESD). (2008b). *Managing Sustainable Development: A Discussion Paper*.
- Ellis, M. (2008). An evaluation of Canada's environmental sustainability planning system. Master's thesis, Simon Fraser University.
- Ellis, M., Gunton, T., and M. Rutherford. (2010). *A methodology for evaluating environmental planning systems: A case study of Canada*. *Journal of Environmental Management*. Pp1-10.
- Environment Canada. (2008). *Environment Canada: Environmental Indicator Reporting* [Powerpoint slides]. Author: Paula Brand.
- Environment Canada. (2009). Evaluation of the Canadian Environmental Sustainability Indicators (CESI) Initiative: Final Report. Audit and Evaluation Branch. Retrieved from: http://ec.gc.ca/doc/ae-ve/2008-09/906/906_eng.html
- Environment Canada. (June 2011). *About the Canadian Environmental Sustainability Indicators*. Retrieved from: <http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=En&n=47F48106-1>
- Environment Canada. (2013). *Environmental Indicators*. Retrieved from <http://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=En>
- European Union. (2011). *Sustainable development in the European Union: 2011 monitoring report on the EU sustainable development strategy*. Luxembourg: Publications Office of the European Union. Retrieved from http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-31-11-224/EN/KS-31-11-224-EN.PDF
- Federal, Provincial and Territorial Governments of Canada. (2010). *Canadian Biodiversity: Ecosystem Status and Trends 2010*. Canadian Councils of Resource Ministers. Ottawa, ON. Retrieved from http://www.biodivcanada.ca/83A35E06-FA6B-4811-8BB7-E33692D46E60/EN_CanadianBiodiversity_Overview_Dec2010.pdf
- Global Reporting Initiative (GRI). (2005). *GRI Sector Supplement for Public Agencies*. Boston, GRI.
- Gouvernement du Québec. (2013a) Recueil des indicateurs de développement durable: Mise à jour du 25 avril 2013. Retrieved from http://www.stat.gouv.qc.ca/donstat/dev_durable/indicateur1_an.htm

- Gouvernement du Québec. (2013b) Indicateur de suivi des objectifs de la Stratégie gouvernementale de développement durable 2008-2013: Ensemble des indicateur en format PDF. Retrieved from: http://www.stat.gouv.qc.ca/donstat/dev_durable/indicateur2.htm
- Gunton, T., and Joseph, C. (2006) *Toward a National Sustainable Development Strategy for Canada: Putting Canada on the Path to Sustainability Within a Generation*. Vancouver: David Suzuki Foundation
- Gunton, T., K. Calbick, A. Bedo, H. Budney, E. Chamberlain, A. Cullen, K. Englund, et al. 2006. *From Coast to Coast: Charting the Environmental Performance of Canada's Provinces*. Unpublished manuscript.
- Gunton, Thomas I. (2006). Planning: An Introduction. In *Encyclopedia of Governance*, ed. Mark Bevir. Thousand Islands, California: Sage Publications. pp. 322- 327.
- Holling, C. S., editor. 1978. *Adaptive environmental assessment and management*. John Wiley, New York, new York, USA.
- International Institute for Sustainable Development (IISD). (2005). *Sustainable Development Indicators: Proposals for a Way Forward*. Prepared for the United Nations Division for Sustainable Development. Retrieved from <http://www.iisd.org/publications/pub.aspx?pno=769>
- Jabareen, Y. (2008). *A new conceptual framework for sustainable development*. *Environment Development and Sustainability*, 10, pp. 179–192.
- Johnston, P., Everard, M., Santillo, D., and Robert, K. H. (2007). Reclaiming the definition of sustainability. *Environmental Science and Pollution Research*, 14(1), pp. 60–66.
- Lee, K. (1993). *Compass and Gyroscope: Integrating science and politics for the environment*. Washington, D.C: Island Press.
- Manitoba. (2009). *2009 Provincial Sustainability Report for Manitoba*. Retrieved from http://www.gov.mb.ca/conservation/pdf/sustainability_report_2009.pdf
- Millennium Ecosystem Assessment (MEA). (2005). *Ecosystems and Human Well-being: Synthesis*. Washington, D.C: Island Press.
- New England Governors and Eastern Canadian Premiers' Conference (NEG/ECP). (2011). *New England Governors and Eastern Canadian Premiers' Annual Conference*. Retrieved from: <http://www.cap-cpma.ca/default.asp?mn=1.98.3.26>
- Northwest Territories. (2012). *NWT State of the Environment Report*. Retrieved from http://www.enr.gov.nt.ca/_live/pages/wpPages/SOE_Welcome.aspx
- Nova Scotia. (2010a). *Environmental Goals and Sustainable Prosperity Annual Report 2010*. Retrieved from <http://gov.ns.ca/nse/egspa/docs/EGSPA.2010.Annual.Report.pdf>
- Nova Scotia. (2010b). *Environmental Goals And Sustainable Prosperity Act: Measuring up - Tracking economic progress: Technical report*. <http://www.gov.ns.ca/nse/egspa/docs/EGSPA.2010.Technical.Report.pdf>
- Nova Scotia. (2012). *Indicators of Prosperity: Technical Report 2012*. Retrieved from <http://gov.ns.ca/nse/egspa/>

- Ontario Ministry of the Environment. (2005). Transboundary Air Pollution in Ontario. Retrieved from: http://www.ene.gov.on.ca/stdprodconsume/groups/lr/@ene/@resources/documents/resource/std01_079137.pdf
- Ontario Ministry of Natural Resources. (2005). Our Sustainable Future: Strategic Directions. Retrieved from: http://www.mnr.gov.on.ca/stdprodconsume/groups/lr/@mnr/@about/documents/document/mnr_e000002.pdf
- Organization for Economic Cooperation and Development (OECD). (2001). *Strategies for Sustainable Development: Practical Guidance for Development Cooperation*. Paris: OECD Publications. Retrieved from <http://www.oecd.org/dac/environment-development/2669958.pdf>
- Organization for Economic Cooperation and Development (OECD). (2002). *Governance for Sustainable Development: Five OECD Case Studies*. Paris: OECD Publications
- Organization for Economic Cooperation and Development (OECD). (2003). *Policy brief: Policy Coherence: Vital for Global Development*. Retrieved from <http://www.oecd.org/pcd/20202515.pdf>
- Organization for Economic Cooperation and Development. (2008a). *Sustainable Development: Linking economy, society, environment*. Retrieved from <http://www.oecd.org/insights/sustainabledevelopmentlinkingeconomysocietyenvironment.htm>
- Organization for Economic Cooperation and Development (OECD). (2008b). Measuring Sustainable Development. Retrieve http://www.oag-bvg.gc.ca/internet/English/sds_fs_e_33574.html
- Prince Edward Island. (2010). *State of Environment Report 2010*. Retrieved from <http://www.gov.pe.ca/fae/state/index.php3>
- Provincial - Territorial Cap and Trade Initiative Memorandum of Understanding. (2008). Memorandum of understanding between the Government of Ontario and the Government of Québec: A Provincial - Territorial Cap And Trade Initiative. Retrieved from: <http://news.ontario.ca/opo/en/2008/06/memorandum-of-understanding-between-the-government-of-ontario-and-the-government-of-quebec.html>
- Québec Ministère du Développement durable, de l'Environnement et des Parcs. (2007). Un projet de société pour le Québec: Stratégie gouvernementale de développement durable 2008-2013. Retrieved from http://www.mddep.gouv.qc.ca/developpement/strategie_gouvernementale/
- Quebec. (2010). *Quebec's Sustainable Development Indicators: Summary Document*. Retrieved from <http://www.mddep.gouv.qc.ca/developpement/indicateurs/index-en.htm#summary>
- Saskatchewan. (2013). *Saskatchewan's 2013 State of the Environment Report*. Retrieved from <http://www.environment.gov.sk.ca/2013soereport>
- Scheffer, M., Carpenter, S., Foley, J., Folke, C. and Walker, B. (2001). Catastrophic shifts in ecosystems. *Nature*, 413, 591-596.

- The Climate Registry. (2013). List of members. Retrieved from:
<http://www.theclimateregistry.org/members/>
- Standing Committee on Environment and Sustainable Development. (2007). *The Canadian Environmental Protection Act, 1999 – Five-Year Review: Closing The Gaps*. Retrieved from:
<http://www.parl.gc.ca/content/hoc/Committee/391/ENVI/Reports/RP2614246/envirp05/envirp05-e.pdf>
- United Nations Department of Economic and Social Affairs (UN DESA). (2002). Guidance in Preparing a National Sustainable Development Strategy: Managing Sustainable Development in the New Millennium. Background Paper No. 13. Retrieved from http://www.un.org/esa/sustdev/publications/nsds_guidance.pdf
- United Nations Department of Economic and Social Affairs (UN DESA). (2007). *Indicators of Sustainable Development: Guidelines and Methodologies*. Third Eds. United Nations, New York. Retrieved from:
<http://www.un.org/esa/sustdev/natinfo/indicators/guidelines.pdf>
- United Nations Division for Sustainability (UNDS). (1993). *Agenda 21: Earth Summit - The United Nations Programme of Action from Rio*. Retrieved from
<http://sustainabledevelopment.un.org/content/documents/Agenda21.pdf>
- United Nations Division for Sustainability (UNDS). (2000). *Report of the Consultative Group to Identify Themes and Core Indicators of Sustainable Development*. New York, 6-9 March 2000. UN: New York, USA.
- United Nations, European Commission, International Monetary Fund, Organization for Economic Co-operation and Development, World Bank (2003): *Integrated environmental and economic accounting 2003*. Studies in Methods, Handbook on National Accounting, Series F, No. 61, Rev. 1.
- United Nations. (1992). Annex I - Rio Declaration On Environment And Development. In Report Of The United Nations Conference on Environment and Development (Rio De Janeiro, 3-14 June 1992), A/CONF.151/26 (Vol. I). Retrieved from
<http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm>
- US Interagency Working Group on Sustainable Development Indicators. (1998). *Sustainable Development in the United States: An Experimental Set of Indicators*. Washington, D.C.
- Western Climate Initiative. (2013). Program Design. Retrieved from: <http://www.wci-inc.org/program-design.php>
- World Bank. (2002). *Indicators of Environment and Sustainable Development: Theories and Practical Experience*. Environmental Economics Series Paper No. 89. Author: Lisa Segnestam. Retrieved from
<http://siteresources.worldbank.org/INTEEI/936217-1115801208804/20486265/IndicatorsofEnvironmentandSustainableDevelopment2003.pdf>
- World Commission on Environment and Development (WCED). (1987). *Our common future*. England: Oxford University Press. Retrieved from:
<http://www.un.org/documents/ga/res/42/ares42-187.htm>

Yukon. (2013). *Yukon State of the Environment Interim Report 2013: An Update for Environmental Indicators*. Retrieved from <http://www.env.gov.yk.ca/publications-maps/stateenvironment.php>

Legislation Cited

Canadian Environmental Protection Act, S.C. 1999, c.33. Retrieved from <http://laws-lois.justice.gc.ca/eng/acts/c-15.31/>

Constitution Act, 1867, 30 & 31 Victoria, c. 3 (U.K.). Retrieved from <http://laws-lois.justice.gc.ca/eng/Const/FullText.html>

Department of the Environment Act, R.S.C. 1985, c. E-10. Retrieved from <http://laws-lois.justice.gc.ca/eng/acts/E-10/FullText.html>

Environment Act, RSY 2002, c.76. Retrieved from <http://www.gov.yk.ca/legislation/acts/environment.pdf>

Environmental Goals and Sustainable Prosperity Act, Chapter 7 of the Acts of 2007. Retrieved from http://nslegislature.ca/legc/bills/60th_1st/3rd_read/b146.htm

Environmental Protection and Enhancement Act, RSA 2000, c E-12. Retrieved from <http://www.qp.alberta.ca/documents/acts/e12.pdf>

Federal Sustainable Development Act, S.C. 2008, c. 33. Retrieved from <http://laws-lois.justice.gc.ca/eng/acts/F-8.6/FullText.html>

The State of the Environment Report Act, S.S. 1990-91, c S-57.1. Retrieved from <http://www.qp.gov.sk.ca/documents/English/Statutes/Statutes/S57-1.pdf>

The Sustainable Development Act, C.C.S.M. 1997, c. S270. Retrieved from <https://web2.gov.mb.ca/laws/statutes/ccsm/s270e.php>

Species at Risk Act; S.C. 2002, c.29. Retrieved from: <http://laws-lois.justice.gc.ca/eng/acts/S-15.3/>

Federal Sustainable Development Act; S.C. 2008, c. 33 Retrieved from: <http://laws-lois.justice.gc.ca/eng/acts/F-8.6/>

Appendix.

Evaluation Guides for Provincial, Territorial and Federal Governments

A. British Columbia

1. Is monitoring information available in a comprehensive report and/or website?

Yes. See Table 1.

Table A1. Public environmental sustainability monitoring reports

Does the province publish an environmental sustainability monitoring report?	Yes
Report name	Environmental Reporting BC
Year of publication	The province recently adopted an online report. At the time of the evaluation, eight indicators had been updated since the 2007 report.
Other reports of note	Environmental Trends in BC (2007) B.C.'s Coastal Environment (2006) State of British Columbia's Forests (2004, 2006, and 2010) Mackenzie River Basin State of the Aquatic Ecosystem (2004) Environmental Trends in BC (2002, 2000, 1998) State of the Environment Report for British Columbia (1993)

2. Is there a regular public monitoring report measuring sustainability progress?

Fully met. The government recently launched an online report.

3. Is there a clear mandate for regular environmental sustainability reporting?

No.

4. a. Is the environmental sustainability monitoring report prepared by an independent agency?

No.

b. Is progress monitoring performed by an independent agency?

Yes, by the Auditor General of BC and the BC Progress Board. See Table 2.

Table A2. Environmental sustainability monitoring reporting by an independent agency

Yes or No	Yes
What is the name of the agency?	Auditor General of BC BC Progress Board
List the most recent reports	<p>Auditor General of BC</p> <ul style="list-style-type: none"> • Management of Groundwater Resources (follow-up) (2013) • Management of Timber (follow-up) (2013) • Carbon Neutral Government (2013) • Biodiversity in B.C.: Assessing the Effectiveness of Key Tools (2013) • Environmental Assessment Office's Oversight of Certified Projects (follow-up) (2012) • Conservation of Ecological Integrity in B.C. Parks and Protected Areas (follow-up) (2012) • Agricultural Land Commission (follow-up) (2012) • Two P3 Projects in the Sea-to-Sky Corridor (2012) • Management of Timber (2012) • Conservation of Ecological Integrity in B.C. Parks and Protected Areas (follow-up) 2011) • Agricultural Land Commission (follow-up) (2011) • Environmental Assessment Office's Oversight of Certified Projects (2011) • Oil and Gas Site Contamination Risks (follow-up) (2011) • Management of Groundwater Resources in British Columbia (2010) • Oil and Gas Site Contamination Risks (follow-up) (2010) • Agricultural Land Commission (2010) • Conservation of Ecological Integrity in B.C. Parks and Protected Areas (2010) • Oil and Gas Site Contamination Risks (2010) • Removing Private Land from Tree Farm Licenses 6, 19 & 25: Protecting the Public Interest? (follow-up) (2010) • Removing Private Land from Tree Farm Licenses 6, 19 & 25: Protecting the Public Interest? (2009) <p>BC Progress Board</p> <p>Established in 2001, the BC Progress Board is an independent panel of senior business executives and academic leaders that produces benchmark and advisory reports on the province's economic progress, and environmental and social condition. In terms of environmental monitoring, using the benchmark reports, the board tracks "environmental quality" using 3 indicators: air quality, per capita GHG emissions and protected areas (however additional measures are sometime also described) and ranks BC relative to other provinces and Canada (for GHG emissions BC is also</p>

Yes or No	Yes
	ranked among 33 OECD member nations). As of yet, none of the advisory reports (issue-specific) feature environmental performance monitoring (mostly economic and social issues).

5. What proportion of the 42 environmental categories is included in the monitoring report?

Fourteen of 42 environmental categories are included in the monitoring report. See Table 3.

6. What proportion of the environmental indicators used by the jurisdiction is assessed relative to targets?

One of the 34 indicators used in the report is assessed relative to targets. See Table 3.

7. What proportion of the environmental indicators used by the jurisdiction is assessed relative to trends?

Twenty of the 34 indicators used in the report are assessed relative to trends. See Table 3.

8. What proportion of the environmental indicators used by the jurisdiction is assessed relative to comparable jurisdictions?

Three of the 34 indicators used in the report are assessed relative to comparable jurisdictions. See Table 3.

Table A3. Environmental categories included in the report and assessed relative to targets, trends and other jurisdictions. Partial targets are included in grey but were not counted towards the total.

Indicators used in the report	Corresponding environmental category	Target	Trend	Comparable jurisdiction
Air Quality – Fine Particulate Matter	Air Quality – Particulates	Annual BC objective	No	Vancouver, Ottawa, Toronto, Montreal
Climate Change – Long-Term Trends in Air Temperature in British Columbia	No	No	No	No

Indicators used in the report	Corresponding environmental category	Target	Trend	Comparable jurisdiction
Climate Change – Precipitation Changes in British Columbia	No	No	No	No
Climate Change - Coastal Sea Surface Temperature	No	No	Change in sea-surface temperature since 1950	No
Climate Change - Changes in Annual Mean Sea Level on the British Columbia Coast	No	No	No	No
Contaminants – Total On-Site Discharges of Toxic Substances in B.C.	Air Emissions – Nitrogen, Volatile Organic Compounds, Carbon Monoxide, Ozone Depleting Substances, Sulfur Oxide Waste Generation and Treatment – Hazardous Water	No	2002-2005	No
Contaminants – Dioxin and Furan Levels in Pulp Mill Effluent, Sediments and Crabs	No	No	1990-2003	No
Contaminants – Clean-Up of Contaminated Sites in B.C.	No	No	No	No
Contaminants – Landscape Pesticide Use in the Lower Mainland	Agricultural Practices – Pesticide Use	No	1991-2003	No
Contaminants – Trends in Persistent Organic Pollutants in Bird Eggs	No	No	No	No
Contaminants – Persistent Organic Pollutants in Tissues of Marine Mammals	No	No	No	No

Indicators used in the report	Corresponding environmental category	Target	Trend	Comparable jurisdiction
Contaminants – Long-Term Deposition of Pollutants in Sediments on the Coast	No	No	No	No
Land – Trends in Ecosystem Protection through Establishment of B.C. Parks and Protected Areas	Protecting Nature – Protected Areas	No	1911-2012	No
Land – Changes in Road Intensity and Length in B.C.	No	No	1988-2005	No
Land – Increases and Decreases in Types of Land Use in Metro Vancouver Since 1986	No	No	1986-2003	No
Land – Changes in the Agricultural Land Reserve in B.C.	No	No	1974-2000	No
Land – Trends in Number of Road Crossings of Streams	No	No	No	No
Land – Economic and Conservation Tenures in the Intertidal Areas of B.C. Estuaries	No	No	No	No
Land – Change in Area of Sensitive Ecosystems on Eastern Vancouver Island and the Gulf Islands	No	No	1992, 2004	No
Marine – Density of Marine Traffic along the BC Coast	No	No	No	No
Plants and Animals - Trends in the Status of Native Vertebrate Species in B.C.	Protecting Nature – Biodiversity	No	1992-2012	No
Plants and Animals - Grizzly Bear Population Status in B.C.	No	No	Mortality by cause, 1976-2011	No

Indicators used in the report	Corresponding environmental category	Target	Trend	Comparable jurisdiction
Sustainability – BC Population Density and Distribution	No	No	No	No
Sustainability – Intensity of Conventional Energy Use in Economic Activity in British Columbia	Natural Resource Consumption – Energy Efficiency	No	1981-2003	No
Waste – Municipal Solid Waste Disposal in B.C.	Waste Generation and Treatment – Municipal Waste	No	1990-2012	Japan (international leader), Nova Scotia (Canadian leader)
Waste – Trends in B.C. Scrap Tire Recycling through Industry-led Product Stewardship	Waste Generation and Treatment – Recycling	No	1991-2011	No
Waste – Level of Municipal Wastewater Treatment in B.C.	Waste Generation and Treatment – Sewage Treatment	No	1983-2004	No
Waste – Trends in shellfish closures due to sewage contamination	Waste Generation and Treatment – Sewage Treatment	No	1989-2005	No
Waste – Proportion of B.C. Coastal Population Served by Municipal Wastewater Treatment	Waste Generation and Treatment – Sewage Treatment	No	1983-1999	No
Water – Summary of Online Water Data & Information Resources for B.C.	No	No	No	No
Water – Daily Water Use Per Person in British Columbia	Natural Resource Consumption – Water Conservation	No	1983-2004	Canadian average

Indicators used in the report	Corresponding environmental category	Target	Trend	Comparable jurisdiction
Water – Water Quality Index for Surface Water Bodies in British Columbia	Surface Water Quality – Heavy Metals, Phosphorus, Nitrogen, Dissolved Oxygen, Biochemical Oxygen Demand, Suspended Solids, Coliform	No	No	No
Water – Surface Water Quality in British Columbia	Surface Water Quality – Heavy Metals, Phosphorus, Nitrogen, Dissolved Oxygen, Biochemical Oxygen Demand, Suspended Solids, Coliform	No	Trend is described	No
Water – Observation Wells With Declining Water Levels Mainly Due to Human Activity	Natural Resource Consumption – Water Conservation	No	1985-2005	No
Water – Heavily Developed Aquifers in British Columbia	No	No	No	No
Total Indicators Used	Total Categories Covered	Total Targets	Total Trends	Total Comparable Jurisdictions
34	14/42	1/34	20/34	3/34

9. Is there a mandatory review and revision of the environmental sustainability planning system based on the monitoring results?

Not met. There is no comprehensive review mandated within the government.

Alberta

1. Is monitoring information available in a comprehensive report and/or website?

Yes. See Table 1.

Table 1. Public environmental sustainability monitoring reports

Does the province publish an environmental sustainability monitoring report?	Yes
Report name	Alberta State of the Environment Report
Year of publication	Online, continuously updated
Other reports of note	Alberta Environment published reports through the 1990s (1994 Comprehensive Report, 1995 Waste Management Report, 1996 Aquatic Ecosystems Report, 1997 Terrestrial Ecosystems Report, 1998 Air Quality Report, 1999 Wildlife Report). The state of environment reporting has since been moved online.

2. Is there a regular public monitoring report measuring sustainability progress?

Fully met. The government regularly updates its online report.

3. Is there a clear mandate for regular environmental sustainability reporting?

Yes. Section 15 of the *Environmental Protection and Enhancement Act* states that “the Minister shall report annually on the state of the Alberta environment”.

4. a. Is the environmental sustainability monitoring report prepared by an independent agency?

No.

b. Is progress monitoring performed by an independent agency?

Yes, by the Auditor General of Alberta. See Table 2.

Table 2. Environmental sustainability monitoring reporting by an independent agency

Yes or No	Yes
What is the name of the agency?	Auditor General of Alberta
List the most recent	• Climate Change (follow-up) and Reforestation (follow-up) (Oct 2012)

reports	<ul style="list-style-type: none"> • Systems to Promote Drinking Water Safety and Regulate Water Well Drilling (follow-up) (July 2012) • Climate Change and Emissions Management Fund - Use of Offsets (follow-up) (Nov 2011) • Confined feeding operations, including risks to surface and ground water (Apr 2011) • Royalty Review Systems (follow-up) (Apr 2011) • Reforestation and seed inventory (follow-up) (Apr 2011) • Alberta's Commitment to Sustainable Resource Development (follow-up) (Oct 2010) • Managing Alberta's Water Supply, including monitoring and reporting, Water Act regulatory activities, and effective operation (Oct 2010) • Environment, Alberta's Response to Climate Change—Part 2 (monitoring compliance with the Specified Gas Emitters Regulation) (Oct 2009) • Sustainable Resource Development, Reforestation (follow-up) (Apr 2009) • Drinking Water (follow-up) (Apr 2009) • Management of sand and gravel resources (Oct 2008) • Enforcement of reclamation obligations (Oct 2008) • Flat fee security deposit (Oct 2008) • Quantity of aggregate removed (Oct 2008) • Alberta's Bioenergy Programs (Oct 2008) • Alberta's response to climate change (Oct 2008) • Climate Change and Emissions Management Fund (Oct 2008)
---------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

5. What proportion of the 42 environmental categories is included in the monitoring report?

Fourteen of 42 environmental categories are included in the monitoring report. See Table 3.

6. What proportion of the environmental indicators used by the jurisdiction is assessed relative to targets?

Thirteen of the 40 indicators used in the report is assessed relative to targets. See Table 3.

7. What proportion of the environmental indicators used by the jurisdiction is assessed relative to trends?

Thirty-three of the 40 indicators used in the report are assessed relative to trends. See Table 3.

8. What proportion of the environmental indicators used by the jurisdiction is assessed relative to comparable jurisdictions?

Four of 40 indicators used in the report are assessed relative to comparable jurisdictions. See Table 3.

Table 3. Environmental categories included in the report and assessed relative to targets, trends and other jurisdictions. Partial targets are included in grey but were not counted towards the total.

Indicators	Corresponding environmental category	Target	Trend (years of data)	Comparable jurisdiction
Air – Alberta’s Air Quality Index	Air quality – Sulfur, Nitrogen, Particulates, Carbon monoxide and Ozone	No	1998-2009	No
Air – Benzene Levels	No	One-hour ambient air quality objective of 30 µg/m ³	1990-2010	No
Air – Benzo(a)pyrene Levels	No	Annual AAQO of 0.3ng/m ³	1990-2009	No
Air – Carbon Monoxide Levels	Air quality – Carbon Monoxide	1 hour objectives of 13 ppm and 8 hour objective of 5 ppm	1990-2012	No
Air – Fine Particulate Matter (PM 2.5)	Air quality – Particulates	24 hour AAQO of 30 µg/m ³ and 1 hour guideline of 80 µg/m ³	1994-2010	No
Air – Hydrogen Sulphide Levels	No	1-hour objective of 10 ppb and 24 hour objective of 3 ppb	1990-2012	No
Air – Nitrogen Dioxide Levels	Air quality – Nitrogen	Mean annual objective 24 ppb	1990-2012	No
Air – Ozone Levels	Air quality – Ozone	Daily max 1 hour average of 82 ppb	1990-2012	No

Air – Sulphur Dioxide Levels	Air quality – Sulphur	1 hour objective of 172 ppb, 24 hour objective	1990-2010	No
Air – Acidifying Precipitation (annual trend in wet deposition)	No	No	1992-2010	No
Air – Particulate Matter and Ozone -Progress towards meeting the Canada Wide Standards	Air Quality – Particulate Matter and Ozone	PM2.5: 30 µg/m ³ averaged over 24 hours by 2010 Ozone: 65 ppb averaged over 8 hours by 2010	2001-2008	No
Water – Alberta River Flow Quantity Index	No	No	1990-2010	No
Water – Lake Water Trophic Status	No	No	No	No
Water – Overall River Water Quality	Surface Water Quality – Heavy Metals, Nitrogen, Dissolved Oxygen, and Coliform	No	No	No
Water – Bacterial Index	Surface Water Quality – Coliform	No	No	No
Water – Nutrient Index	Surface Water Quality – Nitrogen, Phosphorus, Dissolved Oxygen	No	No	No
Water – Pesticide Index	Agricultural Practices – Pesticide Use	No	No	No
Water – Status of Alberta Lake Levels	Natural Resource Consumption – Water Conservation	No	2004-2012	No
Water – Sectoral Water Allocations	Natural Resource Consumption – Water Conservation	No	1900-2010	No
Water – Water Allocation Compare to Natural Flow	Natural Resource Consumption – Water Conservation	30 per cent improvement in overall water conservation and productivity over the 2005	1900-2010	No

		level by 2015		
Water – Water Used for Irrigation	Natural Resource Consumption – Water Conservation	No	1976-2011	No
Water – Water Used for Oilfield Injection Purposes	Natural Resource Consumption – Water Conservation	No	1973-2012	No
Water – Methane Gas in Groundwater	No	No	No	No
Water – Nitrate in Groundwater	No	Canadian Drinking Water Guideline for nitrate (as NO ₃ -N) is 10 mg/l	No	No
Water – Coalbed Methane Wells	No	No	2004-2009	No
Water – Water Well Density	Natural Resource Consumption – Water Conservation	No	1901-2010	No
Land – Acidification of Sensitive Soils	No	No	1981-2008	No
Land – Per Capita Waste Disposal	Waste Generation and Treatment – Municipal Waste	No	1988-2010	No
Land – Pesticide Use	Agricultural Practices – Pesticide Use	No	1993-2008	No
Land – Coal Mining Development and Reclamation	No	No	1999-2010	No
Land – Hazardous Waste Recycling	Waste Generation and Treatment – Hazardous Waste	No	1991-2011	No
Land – Oil and Gas Wells Reclamation	No	No	1963-2011	No
Land – Oil Sands Mining Development and Reclamation	No	No	2071-2012	No
Land – Solid Waste Diversion	Waste Generation and Treatment – Recycling	No	1996-2008	All Canadian jurisdictions
Land – Timber Harvest versus Allowable Cut	Protecting Nature – Forest Harvest	No	2005-2010	National average

Land – Parks	Protecting Nature – Protected Areas	No	1994-2008	
Land – Wildfires	No	Yes – 97.7% contained within first burning period	2006-2010	No
Biodiversity – Percentage of Species at Risk	Protecting Nature – Species at Risk	Yes – Less than 5%	2000-2010	National average
Biodiversity – Status of Alberta Species	Protecting Nature – Biodiversity	No	2000-2010	National comparisons
Total Indicators Used	Total Categories Covered	Total Targets	Total Trends	Total Comparable Jurisdictions
39	14/42	13/40	33/40	4/40

9. Is there a mandatory review and revision of the environmental sustainability planning system based on the monitoring results?

Partially Met.

There is no comprehensive review mandated within the government but some strategies, policies, and/or legislation contain statements or commitments on the use of monitoring results in revising the environmental planning system. For instance:

- Alberta’s environmental plan to deal with cumulative effects of development (2007): “The [cumulative airshed] target will be subject to review every five years, at which time the current state of air quality and emissions reduction technologies will be considered.”
- Alberta Land-use Framework Report (2008): “The Land-use Framework will be based on a system for continuous improvement. Plans and actions may be adjusted and incorporate new technology or new information. If there are unintended negative consequences, Cabinet may correct or repeal provincial policy as needed.”
- Provincial Energy Strategy (2008): “The Government will develop an implementation plan that will include a monitoring process to facilitate the assessment of our progress towards meeting the policy objectives of the strategy and allow us to reassess our objectives and strategies on an ongoing basis as conditions evolve. [...] the implementation plan will incorporate three horizons: short-term, medium-term and long-term. Benchmarks and outcomes will be identified over each horizon.”

- Alberta's Commitment to Sustainable Resource and Environmental Management (1999) states that "legislation and policy that reflects modern approaches, including firm but fair enforcement mechanisms, and that are regularly reviewed and revised to ensure that they are effective and efficient. [...] Alberta's policy and legislation shall continue to incorporate new and innovative approaches."

Saskatchewan

1. Is monitoring information available in a comprehensive report and/or website?

Yes. See Table 1.

Table 1. Public environmental sustainability monitoring reports

Does Saskatchewan publish an environmental sustainability monitoring report?	Yes
Report name	Saskatchewan State of Environment Report
Year of publication	2013
Other reports of note	<p>Saskatchewan's State of Environment Report (2011) Saskatchewan's State of Environment Report (2005) Saskatchewan's State of Environment Report (2003)</p> <p>Other: Report on Saskatchewan Forests (2012) Saskatchewan Water Authority – State of the Watershed Report (2010) State of Provincial Forests Report (2009) Report on Saskatchewan Forests (2008) Report on Saskatchewan's Provincial Forests (2007) State of the Watershed Report (2007)</p> <p>The Environment Plan 2011-12 also contain a section on performance measures including trend information on:</p> <ul style="list-style-type: none"> • Crown land under integrated land use plans (2000-2010), • Number of hunting and angling licenses sold (1999-2009), • Air quality index (2000-2010), • Recycling rates (1997-2009), • Numbers of hectares in the Representative Areas Network (2001-2010), • Drinking Water Quality Standards compliance (1999-2010), • Drinking water quality satisfaction (2001-2010)

2. Is there a regular public monitoring report measuring sustainability progress?

Fully met. The government published a report in 2013.

3. Is there a clear mandate for regular environmental sustainability reporting?

Yes. The *State of the Environment Report Act 1990* requires that the government prepare a provincial State of the Environment report every 2 years. Further, the *Forest Resources Management Act* states that the department shall prepare and submit a report on the state of provincial forests at least once every ten years.

4. a. Is the environmental sustainability monitoring report prepared by an independent agency?

No.

b. Is progress monitoring performed by an independent agency?

Yes, by the Auditor General of Saskatchewan.

Table 2. Environmental sustainability monitoring reporting by an independent agency

Yes or No	Yes
What is the name of the agency?	Auditor General of Saskatchewan
List the most recent reports	<ul style="list-style-type: none"> • Managing the Risks and Cleanup of Oil and Gas Wells (2012) • Pesticide Regulation (follow-up) (2012) • Regulating pipelines (2012) • Provision of Safe Drinking Water to Saskatchewan's Northern Settlements (2012) • Maintaining Facilities in a Sustainable Way (2012) • Saskatchewan Water Corporation (2012) • Saskatchewan Power Corporation (2011) • Environment (2011) - air, contaminated sites, restoration, compliance and enforcement • Energy resources (2010) • Pesticide Regulation (follow-up) (2010) • Regulating reforestation (2009) • Progress toward improving regulation of air emissions (follow-up) (2009) • Regulating contaminated sites (follow-up) (2009) • Provincial park system capital asset plan (2009) • Pesticide regulation (follow-up) (2009) • Regulating contaminated sites (2008) • Pesticide regulation (2007) • Watershed Authority (2005) • Process to regulate quality of drinking water (2005)

	<ul style="list-style-type: none"> • The Auditor General also audits how well forest companies are achieving the objectives set out in their Forest Management Plans and has issued the Independent Sustainable Forest Management Audit Manual, which sets out the protocols for periodic independent audits. Audit results for each company are made public as they become available.
--	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

5. What proportion of the 42 environmental categories is included in the monitoring report?

Eighteen of 42 environmental categories are included in the monitoring report. See Table 3.

6. What proportion of the environmental indicators used by the jurisdiction is assessed relative to targets?

Zero of 17 indicators used in the report are assessed relative to targets. See Table 3.

7. What proportion of the environmental indicators used by the jurisdiction is assessed relative to trends?

Fifteen of 17 indicators used in the report are assessed relative to trends. See Table 3.

8. What proportion of the environmental indicators used by the jurisdiction is assessed relative to comparable jurisdictions?

Two of 17 indicators used in the report are assessed relative to comparable jurisdictions. See Table 3.

Table 3. Environmental categories included in the report and assessed relative to targets, trends and other jurisdictions. Partial targets are included in grey but were not counted towards the total.

Indicators	Corresponding environmental category	Target	Trend	Comparable jurisdiction
Air (Condition) – Air Pollutant Concentration (reported as an Air Quality Index)	Air Quality – Sulfur, Nitrogen, Particulates, Carbon Monoxide, Ozone	No	2003-2012	No
Air (Stressor) – Air	Air Emissions – Nitrogen,	No	2000-2010	Alberta

Pollutant Volume	Particulates, Sulfur Oxide			
Air (Response) – Air Zone Management	No	No	No	No
Climate (Stressor) – Greenhouse Gas Emissions	Air Emissions – Greenhouse Gas	No	1990-2010	Canada
Land (Condition) – Agricultural Land Cover	No	No	1976-2011	No
Land (Stressor) – Mineral Disposition Activity	No	No	2005, 2011	No
Land (Response) – Area Under Zero-Till	No	No	1991-2011	No
Land (Response) – Private Land Stewardship	No	No	2008, 2012	No
Land (Response) – Waste Recycling	Waste Generation and Treatment – Recycling	No	2001-2012	No
Forest (Condition) – Forest Type and Age Class	No	No	No	No
Forest (Stressor) – Forest Wildlife Disturbance	No	No	1980-2012	No
Forest (Stressor) – Forest Insect and Disease Disturbance	No	No	1982-2011	No
Forest (Stressor) – Proportion of Sustainable Harvest Level Utilized	No	No	2001-2011	No
Forest (Response) – Forest Regeneration	No	No	No	No
Water (Condition) – Surface Water	Surface Water Quality – Heavy	No	2003-2007, 2008-2012	No

Quality	Metals, Phosphorus, Nitrogen, Dissolved Oxygen			
Water (Stressor) – Surface Water Quantity	No	No	No	No
Water (Response) – Water Consumption and Conservation	Natural Resource Consumption – Water Conservation	No	2007, 2011	No
Total Indicators Used	Total Categories Covered	Total Targets	Total Trends	Total Comparable Jurisdictions
17	18/42	0/17	15/17	2/17

9. Is there a mandatory review and revision of the environmental sustainability planning system based on the monitoring results?

Not met. There is no comprehensive review mandated within the government.

Manitoba

1. Is monitoring information available in a comprehensive report and/or website?

Yes. See Table 1.

Table 1. Public environmental sustainability monitoring reports

Does the province publish an environmental sustainability monitoring report?	Yes
Report name	Manitoba Sustainability Report 2009
Year of publication	2009
Other reports of note	Manitoba Sustainability Report (2005) Manitoba Conservation Forestry Branch Five-Year Report on the Status of Forestry (2006) State of the Environment Report (1997)

2. Is there a regular public monitoring report measuring sustainability progress?

Partially met. The government last published a report in 2009.

3. Is there a clear mandate for regular environmental sustainability reporting?

Yes. Part 5 (sections 9-10) of Manitoba's *Sustainable Development Act* mandates the minister to establish sustainability indicators and reporting. The sustainability indicators must be selected through a consultative process with the public and experts. Based on these indicator, the minister must prepare a Provincial Sustainability Report "within four years after their establishment and thereafter within one year after the release of data from the national census of the Government of Canada, or at such other times as may be decided by the minister" (section 10(1)). The legislation also includes a specific reporting requirement on progress related to government procurement commitments.

4. a. Is the environmental sustainability monitoring report prepared by an independent agency?

No.

b. Is progress monitoring performed by an independent agency?

Yes, by the Auditor General of Manitoba and Manitoba Clean Environment Commission.

Table 2. Environmental sustainability monitoring reporting by an independent agency

Yes or No	Yes
What is the name of the agency?	Auditor General of Manitoba Manitoba Clean Environment Commission
List the most recent reports	<p>Office of the Auditor General Manitoba</p> <ul style="list-style-type: none"> • Conservation and Water Stewardship (follow-up) (2013) • Compliance with Oil and Gas Legislation (follow-up) (2012) • Province's Management of Contaminated Sites and Landfills (follow-up) (2012) • Management of the Environmental Livestock Program (follow-up) (2012) • The Protection of Well Water Quality in Manitoba (follow-up) (Apr 2011) • Managing Climate Change (2010) • The Protection of Well Water Quality in Manitoba (follow-up) (2010) • Sustainable Development Innovations Fund (follow-up) (2009) • Review of the Province of Manitoba's Management of Contaminated Sites (follow-up) (2009) • The Protection of Well Water Quality in Manitoba (follow-up) (2009) • Compliance with Oil and Gas Legislation (2008) • Management of the Environmental Livestock Program (2007) • Management of Contaminated Sites and Landfills (2007) • Sustainable Development Innovations Fund (follow-up) (2005) • Review of the Province's Management of Contaminated Sites (2005) • Protection of Well Water Quality (2005) <p>Manitoba Clean Environment Commission</p> <ul style="list-style-type: none"> • Supplement to An investigation into nutrient reduction and ammonia treatment (2011) • An investigation into changes requested to Louisiana-Pacific. Environment Act License (2010) • An investigation into nutrient reduction and ammonia treatment at the City of Winnipeg's wastewater treatment facilities (2009) • Environmental Sustainability and Hog Production in Manitoba (2007) • Pembina Valley Water Cooperative Supplemental Groundwater Supply (2007)

	<ul style="list-style-type: none"> • Red River Floodway Expansion (2005) • Several Reports on Public Hearings related to municipal wastewater collection and treatment systems, hog processing plant alterations, electricity generation and transmission projects, floodway expansion, and groundwater supply systems. (2003 – 2007)
--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

5. What proportion of the 42 environmental categories is included in the monitoring report?

Twenty-three of 42 environmental categories are included in the monitoring report. See Table 3.

6. What proportion of the environmental indicators used by the jurisdiction is assessed relative to targets?

Four of the 45 indicators used in the report is assessed relative to targets. See Table 3.

7. What proportion of the environmental indicators used by the jurisdiction is assessed relative to trends?

Thirty-nine of the 45 indicators used in the report are assessed relative to trends. See Table 3.

8. What proportion of the environmental indicators used by the jurisdiction is assessed relative to comparable jurisdictions?

Nine of the 45 indicators used in the report are assessed relative to comparable jurisdictions. See Table 3.

Table 3. Environmental categories included in the report and assessed relative to targets, trends and other jurisdictions. Partial targets are included in grey but were not counted towards the total.

Indicators	Corresponding environmental category	Target	Trend	Comparable jurisdiction
Biodiversity and Habitat Conservation – Natural Lands and Protected Areas	Protecting Nature – Protected Areas	Protect five new major areas by 2010	1990-200	No
Biodiversity and Habitat	Protecting Nature – Species at Risk	No	No	No

Conservation – Wildlife Species and Ecosystems at Risk				
Fish – Fish Species Biodiversity and Population	Protecting Nature – Biodiversity	No	1971-2006	No
Fish – Commercial Fish Harvest	Protecting Nature – Fisheries Harvest	No	1971-2006	No
Forests – Forest Type and Age Class	Protecting Nature – Forest Harvest	No	1986-2007	No
Forests – Forest Renewal	No	No	1976-2007	No
Air Quality – Air Quality Index	Air Quality – Sulfur, Nitrogen, Particulates, Carbon Monoxide, Ozone	No	1987-2008	No
Water – Water Quality Index	Surface Water Quality – Heavy Metals, Phosphorus, Nitrogen, Dissolved Oxygen, Suspended Solids, Coliform	Interim goal is to reduce nutrients in Lake Winnipeg to pre-1970 concentrations	1992-2007	No
Water – Water Allocation and Consumption	Natural Resource Consumption – Water Conservation	No	No	No
Climate Change – Average Annual and Seasonal Temperature	No	No	Descriptive	No
Climate Change – Total Annual and Seasonal Precipitation	No	No	Descriptive	No
Climate Change – Greenhouse Gas Emissions	Air Emissions – Greenhouse Gas	6% below 1990 levels by 2012	1990-2007	All provinces and territories
Economic	No	No	1990-2008	Canada

Performance – Real Gross Domestic Product Per Capita				
Economic Performance – Gross Domestic Product by Sector	No	No	No	No
Agricultural Sustainability – Total Net Farm Income		No	1990-2009	No
Agricultural Sustainability – Farm Structure		No	1971-2006	No
Agricultural Sustainability – Adoption of Sustainable Agricultural Management Practices	Agricultural Practices – Pesticide Use, Fertilizer Use	No	Descriptive (1996-2006)	No
Mining – Mineral Exploration	No	No	1999-2008	No
Mining – Mineral Reserves	No	No	1999-2007	No
Mining – Mineral Production	No	No	1999-2008	No
Energy Efficiency and Conservation – Energy Intensity	Natural Resource Consumption – Energy Consumption	Green energy standards for publically-funded buildings	1981-2007	No
Energy Efficiency and Conservation – Renewable Energy Consumed Versus Total Energy Consumed	Natural Resource Consumption – Clean/Renewable Energy Production	No	1980-2007	No
Consumption and Waste Management – Waste Disposal	Waste Generation and Treatment – Municipal Waste	No	2004-2006	No
Consumption and Waste	Waste Generation and Treatment –	No	2004-2008	No

Management – Waste Recycled or Reused	Recycling			
Employment – Labour Force Trends	No	No	2004-2008	No
Employment – Labour Force Opportunities	No	No	2004-2008	No
Employment – Building and Maintaining Vibrant Rural Communities	No	No	2001, 2007	No
Education – Readiness for School	No	No	2005-2007	Canada
Education – Literacy and Numeracy	No	No	No	Canada
Education – High School and Post-Secondary Education Completion	No	No	1996-2007	No
Education – Academic Achievement and Socio-Economic Status	No	No	No	Provinces and Canada
Demographics – Population Growth	No	No	1988-2008	No
Demographics – Migration to Manitoba from Other Jurisdictions	Increase immigration to 20,000 persons annually by 2016	No	1988-2008	No
Equity and Rights – Low Income	No	No	2000-2008	Canada
Equity and Rights – Income Inequality	No	No	1989-2008	Canada
Equity and Rights – Income Dependency	No	No	1989-2008	Canada

Equity and Rights – Community Supported Living	No	No	1999-2010	No
Community and Culture – Community Engagement	No	No	2000,2005	All provinces, territories and Canada
Community and Culture – Heritage Conservation	No	No	1990-2008	No
Community and Culture – Language Diversity	No	No	2001, 2006	No
Governance – Voting Rates	No	No	1959-2007	Canada
Governance – Progress Toward Debt Repayment	No	No	2000-2009	No
Health – Health Status	No	Increase physical activity in Manitoba by 10 per cent by the year 2010 and by 20 per cent by the year 2015	Descriptive	No
Health – Access and Quality of Care	No	No	2000-2007	No
Justice – Crime Rate	No	No	1977-2007	No
Total Indicators Used	Total Categories Covered	Total Targets	Total Trends	Total Comparable Jurisdictions
45	23/42	4/45	39/45	9/45

9. Is there a mandatory review and revision of the environmental sustainability planning system based on the monitoring results?

Not met. There is no comprehensive review mandated within the government.

Ontario

1. Is monitoring information available in a comprehensive report and/or website?

No. Ontario does not produce a comprehensive environmental sustainability monitoring report. The issue-based reports published by Ontario are listed in Table 1.

Table 1. Public environmental sustainability monitoring reports

Does the province publish an environmental sustainability monitoring report?	No
Report name	-
Year of publication	-
Other reports of note	<p>State of Ontario's Protected Areas Report (2011) State of Ontario's Biodiversity (2010) Ontario Water Quality Report (2008) State of the Forest Report (2006)</p> <p>Commitment to report regularly on the state of the environment (MNR Sustainable Directions 2005): In coming years, we expect to see increased concern about the health of our natural environment and ecosystems. As a result, the public will expect that resource information and status reports on the state of natural resources and the environment are readily available. The ministry will create an effective framework for preparing and sharing of this information. A system of monitoring, assessment and reporting will help to gauge our progress, and in the spirit adaptive management, we will use this information to alter our management approaches or modify our strategies and actions in order to achieve results. Public reporting will ensure that we are transparent and accountable for results. Furthermore, it also enables the public and our clients to better engage as partners in resource management and decision-making.</p> <p>Ontario publishes several issue-specific reports called 'State of Resources Reports', available here: http://www.mnr.gov.on.ca/en/Business/SORR/2ColumnSubPage/REPORTSSECTION.html.</p>

2. Is there a regular public monitoring report measuring sustainability progress?

No.

3. Is there a clear mandate for regular environmental sustainability reporting?

No.

4. a. Is the environmental sustainability monitoring report prepared by an independent agency?

No.

b. Is progress monitoring performed by an independent agency?

Yes, by the Auditor General of Ontario and the Environmental Commissioner of Ontario.

Table 2. Environmental sustainability monitoring reporting by an independent agency

Yes or No	Yes
What is the name of the agency?	Auditor General of Ontario Environmental Commissioner of Ontario
List the most recent reports	<p>Office of Auditor General of Ontario</p> <ul style="list-style-type: none"> • Non-hazardous Waste Disposal and Diversion (follow-up) (2012) • Forest Management Program (2011) • Electricity Sector Regulatory Oversight and Renewable Energy Initiatives (2011) • Ontario Clean Water Agency (follow-up) (2010) • Non-Hazardous Waste Disposal and Diversion (2010) • Fish and Wildlife Program (follow-up) (2009) • Hazardous Waste Management (follow-up) (2009) • Forest Fire Management (follow-up) (2008) • Ontario Clean Water Agency (2008) • Mines and Minerals Program (follow-up) (2007) • Hazardous Waste Management (2007) • Fish and Wildlife Program (2007) • Groundwater Program (follow-up) (2006) • Air Quality Program (follow-up) (2006) • Forest Fire Management (2006) • Mines and Minerals Program (2005) • Environment (follow-up) (2005) <p>Environmental Commissioner of Ontario Appointed by the Legislative Assembly, the Environmental Commissioner of Ontario is tasked with monitoring and reporting on compliance with the Environmental Bill of Rights, and the government's</p>

	<p>success in reducing greenhouse gas emissions and in achieving greater energy conservation in Ontario. Recent reports include:</p> <ul style="list-style-type: none"> • Annuals reports - the Environmental Commissioner's annual reports contain a wide range of information on environmental sustainability progress in Ontario including reporting on state of environment monitoring information, as well as progress monitoring. • Climate Change and Greenhouse Gas Reports - the Environmental Commissioner has reported on progress in reducing greenhouse gas emissions annually since 2007/08 • Energy Conservation Progress Reports (2009, 2010, and 2011) • Special Reports - the Environmental Commissioner publishes Special Report periodically. The latest reports include an assessment of Ontario's climate change adaptation strategy (2012), biodiversity (2012), household hazardous waste (2010), species at risk (2009), the effects of budget cuts at MOE and MNR (2007)
--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

5. What proportion of the 42 environmental categories is included in the monitoring report?

Not applicable.

6. What proportion of the environmental indicators used by the jurisdiction is assessed relative to targets?

Not applicable.

7. What proportion of the environmental indicators used by the jurisdiction is assessed relative to trends?

Not applicable.

8. What proportion of the environmental indicators used by the jurisdiction is assessed relative to comparable jurisdictions?

Not applicable.

9. Is there a mandatory review and revision of the environmental sustainability planning system based on the monitoring results?

Partially met. There is no comprehensive review mandated within the government but some strategies, policies, and/or legislation contain statements or commitments on the use of monitoring results in revising the environmental planning system. For instance:

- MNR Sustainable Directions 2005: A system of monitoring, assessment and reporting will help to gauge our progress, and in the spirit of adaptive management, we will use this information to alter our management approaches or modify our strategies and actions in order to achieve results. Public reporting will ensure that we are transparent and accountable for results
- The Biodiversity strategy progress report 2005-2010: Report on the “State of Ontario’s Biodiversity” every five years and issue a first report by 2010 that will:
 - Describe biodiversity reporting standards (criteria and indicators)
 - Establish benchmarks for biodiversity in Ontario to allow future reports to track progress in meeting conservation (protection and sustainable use) goals
 - Identify challenges, risks, threats and opportunities (e.g., the Ministry of Natural Resources’ State of Resources Reporting program, Ontario Breeding Bird Atlas)
 - Be preceded by a brief interim report within two years.

Quebec

1. Is monitoring information available in a comprehensive report and/or website?

Yes. See Table 1.

Table 1. Public environmental sustainability monitoring reports

Does the province publish an environmental sustainability monitoring report?	Yes
Report name	Indicateurs de développement durable
Year of publication	Online, continuously updated (first published in 2009)
Other reports of note	The government of Quebec tracks its progress on sustainability using 3 sets of indicators: - Indicateurs de développement durable (2009) - Indicateurs de suivi des objectifs de la Stratégie gouvernementale de développement durable 2008-2013 (2009, 2010 and 2011) - Indicateurs de suivi des actions de développement durable des ministères et organismes.

2. Is there a regular public monitoring report measuring sustainability progress?

Yes. The government regularly updates the online report.

3. Is there a clear mandate for regular environmental sustainability reporting?

Yes. Section 12 of the *Sustainable Development Act* (2006) states that “not later than one year after the end of the year in which the strategy is adopted, the Minister of Sustainable Development, Environment and Parks submits to the Government for adoption a first list of sustainable development indicators designed to monitor and measure progress in Québec in the area of sustainable development.” It also states that sections 8 and 10 apply, with the necessary modifications, to the adoption of the indicators. Section 8 refers to the need to develop the indicators “in a way that reflects the range of concerns of citizens and communities and all living conditions in Québec, so that the differences between the rural and urban areas and the situation of Native communities are taken into account”, and section 10 refers to the need to make the indicators “published and made accessible”.

4. a. Is the environmental sustainability monitoring report prepared by an independent agency?

No.

b. Is progress monitoring performed by an independent agency?

Yes, by the Auditor General of Quebec and the Commissioner of Sustainable Development.

Table 2. Environmental sustainability monitoring reporting by an independent agency

Yes or No	Yes
What is the name of the agency?	Vérificateur général du Québec et le Commissaire au développement durable
List the most recent reports	<ul style="list-style-type: none"> • Application de la Loi sur le développement durable (2012/13) • Gouvernance de l'eau (2012/13) • Aide financière pour les infrastructures municipales (2012/13) • Contrôle et surveillance de l'assainissement des eaux usées municipales (2012/13) • Contrôle et surveillance de la production d'eau potable (2012/13) • Interventions gouvernementales dans le secteur minier (suivi) (2012/13) • Plan d'action 2006-2012 sur les changements climatiques (2011/12) • Application de la Loi sur le développement durable (2011/12) • Production agricole (suivi) (2011/12) • Mise en application de la Loi sur la qualité de l'environnement dans le secteur industriel (2010/11) • Gestion gouvernementale de l'exploration et de l'exploitation des gaz de schiste (2010/11) • Interventions en matière de développement régional (2010/11) • Application de la Loi sur le développement durable (2010/11) • Maintien de la biodiversité (2009/10) • Application de la Loi sur le développement durable (2009/10) • Services d'eau et pérennité des infrastructures (suivi) (2009/10) • Interventions gouvernementales dans le secteur minier (2008/09) • Planification du transport et de l'aménagement dans la région métropolitaine de Montréal (2008/09) • Application de la Loi sur le développement durable (2008/09) • Commission de protection du territoire agricole du Québec : vérification relative à la gestion, à la conformité et à la reddition de comptes (2007/08) • Application de la Loi sur le développement durable (2007/08)

	<ul style="list-style-type: none"> • Production agricole (2007/08) • Production et consommation responsables - influence sur la réduction à la source (2007/08)
--	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

5. What proportion of the 42 environmental categories is included in the monitoring report?

Fourteen of 42 environmental categories are included in the monitoring report. See Table 3.

6. What proportion of the environmental indicators used by the jurisdiction is assessed relative to targets?

Twenty-six of the 104 indicators used in the report are assessed relative to targets. See Table 3.

7. What proportion of the environmental indicators used by the jurisdiction is assessed relative to trends?

Eighty of the 104 indicators used in the report are assessed relative to targets. See Table 3.

8. What proportion of the environmental indicators used by the jurisdiction is assessed relative to comparable jurisdictions?

Four of the 104 indicators used in the report are assessed relative to targets. See Table 3.

Table 3. Environmental categories included in the report and assessed relative to targets, trends and other jurisdictions. Partial targets are included in grey but were not counted towards the total.

Indicators	Corresponding environmental category	Target	Trend	Comparable jurisdiction
Level 1 – Taux d'activité (Economic Participation Rate)	No	No	1976-2012	No
Level 1 – Qualité de l'emploi (Quality of Employment)	No	No	1997-2012	No
Level 1 – Espérance de vie en bonne santé (Life Expectancy in Good Health)	No	No	2001, 2006	No
Level 1 – Distribution du plus	No	No	No	No

haut niveau de diplomation (Highest Level of Education)				
Level 1 – Personnes ayant un niveau élevé de soutien social (People with High Levels of Social Support)	No	No	2000-2010	No
Level 1 – Temps consacré aux activités organisationnelles (Time Spent on Community Activities)	No	No	1998-2010	Canada
Level 1 – Répartition du revenu (Income Distribution)	No	No	1996-2010	No
Level 1 – Revenu familial excédentaire (Family Income Surplus)	No	No	2001-2010	No
Level 1 – Part des secteurs de la culture et des communications dans l'économie (Share of Sectors of Culture and Communication in the Economy)	No	No	1997-2011	No
Level 1 – Stock net de capital fixe (Net Stock of Fixed Capital)	No	No	1971-2012	No
Level 1 – Stock net de capital fixe en transport collectif (Net Fixed Capital Stock in Public Transportation)	No	No	1971-2011	No
Level 1 – Valeur foncière du parc immobilier (Property Value of the Housing Stock)	No	No	1999-2013	No
Level 1 – Avoirs nets des ménages (Household Net Worth)	No	No	1999, 2005	No
Level 1 – Actifs financiers du gouvernement (Financial Asset of Government)	No	No	1997-2012	No
Level 1 – Superficie du territoire en aires protégées (Land Area in Protected Areas)	Protecting Nature – Protected areas	12% of territory protected by 2015	No	No
Level 1 – Représentativité du réseau d'aires protégées	Protecting Nature –	12% of territory protected by	2002, 2012	No

selon les types de milieu physique (Representative Network of Protected Areas According to Ecozones)	Protected areas	2015		
Level 1 – Superficie du territoire zoné agricole (Land Area Zones Agricultural)	No	No	1997-2012	No
Level 1 – État des écosystèmes forestiers (State of Forest Ecosystems)	Protecting Nature – Biodiversity	No	1970-2003	No
Level 1 – Qualité de l'eau à l'embouchure des principaux bassins versants méridionaux (Water Quality at the Mouth of Major Southern Watersheds)	Surface Water Quality (COMPARE TO PREV APPENDIX)	No	1995-2011	No
Level 1 – Pourcentage annuel de jours sans smog (Annual Percentage of Days Without Smog)	Air Quality – Particulate Matter, Ozone	No	2004-2011	No
Level 1 – Indice annuel de la qualité de l'air (Annual Index of Air Quality)	Air Quality – (COMPARE TO PREV APPENDIX)	No	No	No
Level 1 – Tendance des températures moyennes annuelles (Trends in Mean Annual Temperature)	No	No	1961-2010	No
Level 2 – Publications scientifiques en développement durable (Scientific publications in sustainable development)	No	No	2001-2010	World-wide
Level 2 – Dépenses gouvernementales pour la R-D et l'innovation (Government spending on R&D and innovation)	No	No	2001-2010	No
Level 2 – Ratio des dépenses intérieures de R-D exécutées par les entreprises sur le PIB (Ratio of domestic expenditure on R&D by enterprises to GDP)	No	No	2001-2010	No
Level 2 – Prévalence de l'obésité et de l'embonpoint chez les jeunes et les adultes	No	No	2000-2011	No

(Prevalence of obesity and overweight among youth and adults)				
Level 2 – Nombre d'intoxications d'origine environnementale (Number of poisoning caused by environmental factors)	No	No	2006-2011	No
Level 2 – Proportion des individus ayant une incapacité (Proportion of individuals with disabilities)	No	No	2003-2010	No
Level 2 – Nombre de lésions professionnelles (Number of occupational injuries)	No	No	2002-2011	No
Level 2 – Montants investis pour atténuer ou prévenir les sinistres ou leurs conséquences (Amounts invested to mitigate or prevent losses or consequences)	No	No	2008-2012	No
Level 2 – Taux de réduction de la consommation de carburant dans les ministères et organismes (Reduction rate of fuel consumption by departments and agencies)	Natural Resource Consumption – Energy Consumption	Reduce fossil fuel consumption of departments and ministries 20% (relative to 2003-2004 levels) by 2009-10	2003-2008	No
Level 2 – Taux de réduction de la consommation d'énergie des bâtiments publics (Reduction rate of energy consumption by public buildings)	Natural Resource Consumption – Energy Consumption	Reduce energy consumption of public buildings by 10% (real estate) and 14% (health and education)	2002-2007	No
Level 2 – Consommation énergétique par habitant (Per capita energy consumption)	Natural Resource Consumption – Energy Consumption	No	2000-2009	No
Level 2 – Intensité énergétique (Energy Intensity)	Natural Resource Consumption – Energy Efficiency	No	2000-2009	No
Level 2 – Consommation	Natural Resource	No	2000-2009	No

finale de produits pétroliers, de gaz naturel et d'électricité (Final consumption of oil products, natural gas and electricity)	Consumption – Energy Consumption			
Level 2 – Ratio des matières résiduelles éliminées sur le PIB et par habitant (Ratio of waste disposed by GDP and per capita)	Waste Generation and Treatment – Municipal Waste	No	2008-2011	No
Level 2 – Taux de récupération et de valorisation des matières résiduelles (Recovery and recycling of waste)	Waste Generation and Treatment – Recycling	65 % of recoverable materials in 2008	1998-2008	No
Level 2 – Nouvelle capacité de production d'électricité hydroélectrique et éolienne (New capacity of hydro and wind power generation)	Natural Resource Consumption – Renewable Energy	A portfolio of hydroelectric projects of 4500MW by 2010 and integrate 4000MW of wind energy by 2015	2006, 2011, 2002-2011	No
Level 2 – Quantité d'énergie renouvelable de source hydroélectrique et éolienne produite au Québec (Amount of renewable energy hydro and wind power source produced in Quebec)	Natural Resource Consumption – Renewable Energy	No	2001-2010	No
Level 2 – Nombre de programmes ajustés pour inclure des critères d'écoconditionnalité ou des critères favorisant l'adoption de pratiques responsables (Number of programs adjusted to include the eco-requirements or criteria favoring the adoption of responsible practices)	No	No	2008-2011	No
Level 2 – Compilation des instruments économiques mis en place ou enrichis afin d'adopter des pratiques environnementales (Compilation of economic	No	No	No	No

instruments introduced or enhanced to adopt environmental practices)				
Level 2 – Investissements privés non résidentiels (Private non-residential investment)	No	Increase the average value of non-residential private investment to \$23.5 billion dollars for the period 2005-2010	2004-2013	No
Level 2 – Investissements en machines et équipement du secteur manufacturier (Investment in machinery and equipment manufacturing)	No	Increase the value of investments in machinery and equipment to \$5.5 billion in 2010	2004-2013	No
Level 2 – Indice synthétique de fécondité (Total fertility rate)	No	No	2003-2012	No
Level 2 – Solde migratoire total (Total net migration)	No	No	2002-2011	No
Level 2 – Solde migratoire interrégional (Interregional migration)	No	No	No	No
Level 2 – Taux de présence des immigrants admis au Québec (Presence of immigrants admitted to Quebec)	No	No	2001-2010	No
Level 2 – Rapport de dépendance démographique (Demographic dependence ratio)	No	No	2003-2015 (projection)	No
Level 2 – Taux d'activité des mères d'enfant de moins de 6 ans (Labour force participation rate of mothers with children under 6 years)	No	No	2003-2012	No
Level 2 – Nombre de places à contribution réduite en services de garde éducatifs (Number of places offering	No	220,000 places by 2012	2003-2012	No

regulated educational childcare services)				
Level 2 – Taux d'utilisation du Régime québécois d'assurance parentale (Rate of use of the Quebec Parental Insurance Plan)	No	Maintain 95%	2006-2012	No
Level 2 – Taux de participation au Régime québécois d'assurance parentale (Rate of participation in the Quebec Parental Insurance Plan)	No	Maintain 83% annually	2006-2011	No
Level 2 – Revenu disponible des ménages par habitant (Household disposable income per capita)	No	No	2007-2011 (projected)	No
Level 2 – Taux d'emploi des 15-64 ans (Employment rate for those aged 15-64)	No	Increase the employment rate of Quebecers (15-64) faster than average Canadians over the next five years (2005-2010)	2003-2012	Canada
Level 2 – Rémunération horaire moyenne (Average hourly wage)	No	No	2003-2012	No
Level 2 – Taux de croissance de la productivité du travail au Québec (Labour productivity growth rate in Quebec)	No	No	2002-2011	Canada
Level 2 – Ratio de la dette du gouvernement par rapport au PIB (Ratio of government debt to GDP)	No	Reduce the ratio to a maximum of 45% by March 31, 2026	2007-2012 (2018 projected)	No
Level 2 – Aide financière cumulée aux municipalités pour les inciter et les aider à réduire de 20 % la fréquence des débordements des réseaux unitaires en temps de pluie (Cumulative financial assistance to municipalities to encourage and help them to	Waste Generation and Treatment – Sewage Treatment	No	No	No

reduce by 20% the frequency of overflows from combined sewers in wet weather)				
Level 2 – Nombre de projets de développement soutenus par les pactes ruraux (Number of development projects supported by the rural agreements)	No	No	2007-2013	No
Level 2 – Nombre de laboratoires ruraux lancés et complètes (Number of rural laboratories started and completed)	No	25 rural laboratories by 2010	2008-2013	No
Level 2 – Nombre de produits de spécialité soutenus (Number of specialty products supported)	No	No	2007-2013	No
Level 2 – Personnes dont la langue d'usage à la maison est autochtone (People speaking an indigenous language at home)	No	No	1996-2011	No
Level 2 – Pourcentage d'enfants de moins de 5 ans en services de garde régis (Percentage of children under 5 years of age in registered childcare services)	No	No	2002-2010	No
Level 2 – Besoins de soins de santé non comblés dans les 12 derniers mois (Unmet healthcare needs in the last 12 months)	No	No	2000-2010	No
Level 2 – Achalandage du transport en commun (Transit ridership)	Transportation – Public Transit Use	Increase transit ridership by 8% by the end of 2012	2001-2010	No
Level 2 – Montants versés en vertu du programme d'investissements dédiés à la sauvegarde du patrimoine Culturel (Amounts paid under the investment program dedicated to the preservation	No	Invest 200 million dollars	2006-2012	No

of cultural heritage)				
Level 2 – Ratio des dépenses des entreprises pour la protection de l’environnement sur le PIB (Ratio of business expenditure on environmental protection to GDP)	No	No	2006-2010	Provinces, territories and Canada
Level 2 – Émissions de gaz à effet de serre (Greenhouse gas emissions)	Pollution Emissions – GHG emissions	Reduce GHG emissions by 6% (relative to 1990 levels) by 2012, and by 20% by 2020.	1990-2010	No
Level 2 – Émissions de dioxyde de soufre (SO ₂ emissions)	Pollution Emissions – Sulfur dioxide	No	2001-2010	No
Level 2 – Mise en place d’un programme de conservation et d’utilisation efficace de l’eau (Implementation of a program of conservation and efficient water use)	Natural Resource Consumption – Water consumption	No	No	No
Level 2 – Élaboration d’une méthodologie d’évaluation des impacts cumulatifs des prélèvements d’eau (Development of a methodology to assess cumulative impacts of water withdrawals)	No	No	No	No
Level 2 – État d’avancement du nouveau régime forestier (Progress towards new forestry regime)	Protecting Nature – Forest harvest	No	No	No
Level 2 – Actions internationales importantes qui contribuent à la démarche de développement durable du Québec (Important international actions that contribute to the sustainable development of Québec)	No	No	2009-2012	No
Level 2 – Initiatives de promotion internationale de la	No	No	2009-2012	No

démarche québécoise de développement durable (International initiatives to promote the sustainable development of Quebec)				
Level 2 – Nombre moyen d’heures consacrées au bénévolat (Average hours spent volunteering)	No	146 hours per year	2004-2010	Canada
Level 2 – Soutien financier en appui à la mission globale des organismes communautaires (Financial support for the overall mission of community organizations)	No	No	2002-2012	No
Level 2 – Proportion des candidatures féminines aux élections générales municipales (Proportion of women candidates for general municipal elections)	No	No	2005, 2009	No
Level 2 – Proportion des sorties d’une durée prolongée (6 mois) pour l’ensemble de la clientèle des programmes d’assistance sociale considérée comme apte au travail (Proportion of prolonged leave by clients of social assistance considered employable)	No	79.5% in 2010-2011	2007-2012	No
Level 2 – Taux d’assistance sociale des 0 à 64 ans (Social assistance rates of 0-64 years)	No	Achieve an average social assistance rate of 6.7% in 2010-2011	2002-2012	No
Level 2 – Nombre de logements communautaires et abordables (Number of community and affordable housing)	No	35,000 new housing	2002-2012	No
Level 2 – Nombre de ménages ayant bénéficié d’une adaptation de logement pour répondre à leurs besoins en raison d’une incapacité	No	No	2002-2012	No

physique (Number of households receiving an adaptation of housing to meet their needs due to a physical disability)				
Level 2 – Nombre de ménages bénéficiant d'une aide au logement (Number of households receiving housing assistance)	No	No	2003-2011	No
Level 2 – Rapport de dépendance économique (Dependency ratio)	No	No	2001-2010	No
Level 2 – Taux annuel d'obtention d'un premier diplôme à chaque ordre d'enseignement (Annual rate of obtaining a first degree at each level of education)	No	Reach an annual rate of obtaining a first degree in secondary education of 80% for people less than 20 years old in 2020.	2001-2009	No
Level 2 – Nombre de nouveaux participants à des activités de formation de base (Number of new entrants into basic education)	No	Minimum of 32,000 new participants annually	2002-2012	No
Level 2 – Taux annuel d'un premier accès à chacune des formations qualifiantes (Annual rate of first access to skills training)	No	No	2001-2009	No
Level 2 – Proportion des établissements qui ont offert ou financé de la formation à leurs employés (Proportion of businesses that pay for or provide training to their employees)	No	No	2008-2010	No
Level 2 – Taux de participation de la population de 25 à 64 ans à la formation structure (Participation rate of the population aged 25 to 64 years in classroom training)	No	No	No	No

Level 2 – Nombre d'entreprises nouvellement soutenues dans leurs besoins de formation et de reconnaissance des acquis et des compétences de leur main-d'oeuvre (Number of business newly supported in their training needs and recognition of prior learning and competencies of their workforce companies)	No	Increase by 4 800 between 2008-2009 and 2010-2011	2008-2012	No
Level 2 – Nombre annuel de nouvelles ententes individuelles de qualification de la main-d'œuvre en milieu de travail (Annual number of new agreements qualifying labour in the workplace)	No	4,300 en 2011-2012	2002-2012	No
Total Indicators Used	Total Categories Covered	Total Targets	Total Trends	Total Comparable Jurisdictions
104	14/42	26/104	80/104	4/104

9. Is there a mandatory review and revision of the environmental sustainability planning system based on the monitoring results?

Partially met. There is no comprehensive review mandated within the government but some strategies, policies, and/or legislation contain statements or commitments on the use of monitoring results in revising the environmental planning system. For example:

- Section 7 of the Sustainable Development Act states that “a status report on sustainable development in Québec must also be presented upon periodic reviews of the strategy based on sustainable development indicators or other criteria set out in the strategy to monitor or measure progress in the economic, social and environmental fields”.
- The Government Sustainable Development Strategy 2008-2013 (pg 56), states that the "Les mécanismes pour la production de bilans périodiques de la stratégie qui seront adoptés par le Comité interministériel du développement durable avant l'été 2008 sont de deux ordres:

- un mécanisme de suivi et de mesure de la performance « administrative » de l'appareil gouvernemental (par exemple, le nombre d'actions réalisées);
- un mécanisme permettant de faire le lien entre les résultats atteints par les ministères et les organismes, les objectifs de la stratégie et la progression du développement durable au Québec mesurée à l'aide des indicateurs de développement durable.
- Une équipe du ministère du Développement durable, de l'Environnement et des Parcs sera chargée du suivi de la mise en œuvre de la stratégie. Elle procédera en temps opportun à sa révision avec la collaboration et en concertation avec tous les autres ministères et organismes.
- The Biodiversity Strategy 2004-2007 states, "Normalement, tous les cinq ans ou un peu avant, la plupart des étapes seront reprises pour la révision de la Stratégie québécoise sur la diversité biologique. C'est ainsi que la préoccupation de la sauvegarde du patrimoine biologique deviendra permanente, chacun des gestes des Québécoises et des Québécois nous faisant évoluer vers une plus complète harmonie avec la nature."

New Brunswick

1. Is monitoring information available in a comprehensive report and/or website?

Yes. See Table 1.

Table 1. Public environmental sustainability monitoring reports

Does the province publish an environmental sustainability monitoring report?	Yes
Report name	Air, Land and Water: Reporting to New Brunswickers on Environmental Progress (2003)
Year of publication	2003
Other reports of note	The Public Forest: State of the Forest Report (2008)

2. Is there a regular public monitoring report measuring sustainability progress?

Not met. The government last published a report in 2003.

3. Is there a clear mandate for regular environmental sustainability reporting?

No.

4. a. Is the environmental sustainability monitoring report prepared by an independent agency?

No.

b. Is progress monitoring performed by an independent agency?

Yes, by the Auditor General of New Brunswick. See Table 2.

Table 2. Environmental sustainability monitoring reporting by an independent agency

Yes or No	Yes
What is the name of the agency?	Auditor General of New Brunswick
List the most recent reports	<ul style="list-style-type: none">• Solid Waste Commissions (2012)• Wastewater Commissions (2011)• Environmental Trust Fund (2009)

	<ul style="list-style-type: none"> • Environmental Impact Assessment (2008) • Beverage Containers Program (follow-up) (2008) • Salmon Aquaculture (follow-up) (2008) • Timber Royalties (2008) • Environmental Impact Assessment (2008) • Wildlife Trust Fund (2007) • Environmental Inspections (follow-up) (2006) • Tracking System for Wood Harvested from Private Woodlots (2006) • Crown Lands Management (follow-up) (2005)
--	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

5. What proportion of the 42 environmental categories is included in the monitoring report?

Three of 42 environmental categories are included in the monitoring report. See Table 3.

6. What proportion of the environmental indicators used by the jurisdiction is assessed relative to targets?

Five of 12 environmental categories are included in the monitoring report. See Table 3.

7. What proportion of the environmental indicators used by the jurisdiction is assessed relative to trends?

Eight of 12 environmental categories are included in the monitoring report. See Table 3.

8. What proportion of the environmental indicators used by the jurisdiction is assessed relative to comparable jurisdictions?

Zero of 12 environmental categories are included in the monitoring report. See Table 3.

Table 3. Environmental categories included in the report and assessed relative to targets, trends and other jurisdictions. Partial targets are included in grey but were not counted towards the total.

Indicators	Corresponding environmental category	Target	Trend	Comparable jurisdiction
Air – Attainment of New Brunswick's Air Quality	Air Quality – Carbon Monoxide, Sulfur,	New Brunswick's Air	1996-2001	No

Objectives	Nitrogen, Particulate Matter	Quality Objectives		
Air – Compliance with Canada-wide Standards for Particulate Matter (PM2.5) and Ozone	Air Quality – Particulate Matter, Ozone	Canada-Wide Standard	1997-2001	No
Air – Average Sulphate Concentration in Precipitation	No	No	1996-2001	No
Air – Average Sulphate Concentration in Lakes	No	No	1986-2001	No
Land – Percentage of NB Covered by Municipal or Rural Land Use Plans	No	No	No	No
Land – Number of Designated Wellfields	No	No	No	No
Land – Proportion of Large Petroleum Storage Tanks Meeting Modern Installation Standards	No	No	1968-2002	No
Land – Percentage of New Brunswick's Population with Access to Recycling	Waste Generation and Treatment – Recycling	No	No	No
Water – Percentage of Post-Treatment Tests for Municipal Water Supplies Exceeding Guidelines for Canadian Drinking Water Quality	Drinking Water Quality – Heavy Metals, Turbidity	Guidelines for Canadian Drinking Water Quality	1994-2002	No
Water – Percentage of New Private Wells Exceeding Guidelines for Canadian Drinking Water Quality for Total Coliforms or E. coli	No	Guidelines for Canadian Drinking Water Quality	1994-2002	No
Water – Quality of Major River Systems as Measured by Annual Average Dissolved Oxygen, Nitrates, and pH	Surface Water Quality – Dissolved Oxygen, Nitrogen	Canadian Water Quality Guidelines for the Protection of Aquatic Life	1991-2000	
Water – Proportion of Water Used by Major Sectors	Natural Resource Consumption – Water Consumption	No	No	No
Total Indicators Used	Total Categories	Total Targets	Total Trends	Total

	Covered			Comparable Jurisdictions
12	3/42	5/12	8/12	0/12

9. Is there a mandatory review and revision of the environmental sustainability planning system based on the monitoring results?

Not met.

Nova Scotia

1. Is monitoring information available in a comprehensive report and/or website?

Yes. See Table 1.

Table 1. Public environmental sustainability monitoring reports

Does the province publish an environmental sustainability monitoring report?	Yes
Report name	Indicators of Sustainable Prosperity
Year of publication	2011
Other reports of note	The State of Nova Scotia's Coast Report (2009) State of the Forest Report (April 2008)

2. Is there a regular public monitoring report measuring sustainability progress?

Yes, Nova Scotia's report was last published in 2011.

3. Is there a clear mandate for regular environmental sustainability reporting?

No.

4. a. Is the environmental sustainability monitoring report prepared by an independent agency?

No.

b. Is progress monitoring performed by an independent agency?

Yes, by the Auditor General of Nova Scotia.

Table 2. Environmental sustainability monitoring reporting by an independent agency

Yes or No	Yes
What is the name of the agency?	Auditor General of Nova Scotia
List the most recent reports	<ul style="list-style-type: none"> • Canada-Nova Scotia Offshore Petroleum Board (2011) • Registry of Motor Vehicles Information and Technology (2011) • Management of Contaminated Sites (2010)

	<ul style="list-style-type: none"> • Sustainable Timber Supply (follow-up) (2009) • Fleet Management (follow-up) (2008) • Environmental Monitoring and Compliance (2008) • Sustainable Timber Supply (2006) • Drinking Water Safety System (follow-up) (2005) • Fleet Management (2005)
--	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

5. What proportion of the 42 environmental categories is included in the monitoring report?

Three of 42 environmental categories are included in the monitoring report. See Table 3.

6. What proportion of the environmental indicators used by the jurisdiction is assessed relative to targets?

Sixteen of 16 indicators used in the report is assessed relative to targets. See Table 3.

7. What proportion of the environmental indicators used by the jurisdiction is assessed relative to trends?

Fifteen of 16 indicators used in the report are assessed relative to trends. See Table 3.

8. What proportion of the environmental indicators used by the jurisdiction is assessed relative to comparable jurisdictions?

Sixteen of 16 indicators used in the report are assessed relative to comparable jurisdictions. See Table 3.

Table 3. Environmental categories included in the report and assessed relative to targets, trends and other jurisdictions. Partial targets are included in grey but were not counted towards the total.

Indicators	Corresponding environmental category	Target	Trend	Comparable jurisdiction
Persistence in low income	No	Equal of above the Canadian average by 2020	1999-2010	All provinces and Canada
Income inequality	No	Equal of above the Canadian	2000-2010	All provinces and Canada

		average by 2020		
Sense of belonging to the community	No	Equal of above the Canadian average by 2020	No	All provinces and Canada
Post secondary education	No	Equal of above the Canadian average by 2020	2000-2011	All provinces and Canada
Life expectancy	No	Equal of above the Canadian average by 2020	1997-2009	All provinces and Canada
Employment rates for visible minorities	No	Equal of above the Canadian average by 2020	2001, 2006	All provinces and Canada
Labour productivity	No	Equal of above the Canadian average by 2020	1998-2011	All provinces and Canada
Net investment in capital stock	No	Equal of above the Canadian average by 2020	2001-2010	All provinces and Canada
Personal savings	No	Equal of above the Canadian average by 2020	2005-2010	All provinces and Canada
Consumer spending	No	Equal of above the Canadian average by 2020	2002-2010	All provinces and Canada
Gross Domestic Product	No	Equal of above the Canadian average by 2020	1996-2010	All provinces and Canada
Government debt	No	Equal of above the Canadian average by 2020	2002-2008	All provinces and Canada
Value of natural resources	No	Equal of above the Canadian average by 2020	1997-2010	All provinces and Canada
Value of renewable resources (unharvested timber stock)	Protecting Nature – Forest harvest	Equal of above the Canadian average by 2020	1997-2010	All provinces and Canada
Electricity generated from fossil fuels	Natural Resource Consumption – Energy consumption	Equal of above the Canadian average by 2020	2002-2010	All provinces and Canada
Energy productivity	Natural Resource Consumption –	Equal of above the Canadian	2006-2010	All provinces

	Energy efficiency	average by 2020		and Canada
Total Indicators Used	Total Categories Covered	Total Targets	Total Trends	Total Comparable Jurisdictions
16	3/42	16/16	15/16	16/16

9. Is there a mandatory review and revision of the environmental sustainability planning system based on the monitoring results?

Not met.

Prince Edward Island

1. Is monitoring information available in a comprehensive report and/or website?

Yes. See Table 1.

Table 1. Public environmental sustainability monitoring reports

Does PEI publish an environmental sustainability monitoring report?	Yes
Report name	State of the Environment Report
Year of publication	2010
Other reports of note	State of the Environment 2003 State of the Forest Report 2002

2. Is there a regular public monitoring report measuring sustainability progress?

Yes, PEI's report was last published in 2010.

3. Is there a clear mandate for regular environmental sustainability reporting?

No.

4. a. Is the environmental sustainability monitoring report prepared by an independent agency?

No.

b. Is progress monitoring performed by an independent agency?

Yes, by the Auditor General of Prince Edward Island, however the auditor has only addressed a limited number of environmental issues. See Table 2.

Table 2. Environmental sustainability monitoring reporting by an independent agency

Yes or No	Partial. Limited number of environmental issues addressed.
What is the name of the agency?	Auditor General of Prince Edward Island
List the most recent reports	<ul style="list-style-type: none"> • Office of Energy Efficiency Grants and Loans (follow-up) (2013) • PEI Energy Corporation (follow-up) (2013)

	<ul style="list-style-type: none"> • Office of Energy Efficiency Grants and Loans (2012) • PEI Energy Corporation (follow-up) (2012) • PEI Energy Corporation (follow-up) (2011) • PEI Energy Corporation (follow-up) (2010) • PEI Energy Corporation (follow-up) (2009) • PEI Energy Corporation (follow-up) (2008) • Water Management Division (follow-up) (2008) • Island Waste Management Corporation (follow-up) (2008) • Water Management Division (follow-up) (2007) • Island Waste Management Corporation (follow-up) (2007) • PEI Energy Corporation (2007) • Water Management Division (follow-up) (2006) • Island Waste Management Corporation (follow-up) (2006) • Island Waste Management Corporation (2005)
--	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

5. What proportion of the 42 environmental categories is included in the monitoring report?

Thirteen of 42 environmental categories are included in the monitoring report. See Table 3.

6. What proportion of the environmental indicators used by the jurisdiction is assessed relative to targets?

Sixteen of the 35 indicators used in the report is assessed relative to targets. See Table 3.

7. What proportion of the environmental indicators used by the jurisdiction is assessed relative to trends?

Thirty-two of 35 indicators used in the report is assessed relative to targets. See Table 3.

8. What proportion of the environmental indicators used by the jurisdiction is assessed relative to comparable jurisdictions?

One of 35 indicators used in the report is assessed relative to targets. See Table 3.

Table 3. Environmental categories included in the report and assessed relative to targets, trends and other jurisdictions. Partial targets are included in grey but were not counted towards the total.

Indicators	Corresponding environmental category	Target	Trend	Comparable jurisdiction
Nitrate in Private Well Water	No	Average nitrate concentration of 3 mg/L or less (province-wide) and no wells exceeding the maximum 10 mg/L guideline recommended by the Guidelines for Canadian Drinking Water Quality	1984-2009	No
E. coli in Private Wells	No	No wells testing positive for E. coli	2000-2009	
Water and Wastewater Central Servicing for Prince Edward Island	Waste Generation and Treatment – Sewage treatment	No	1998-2005	No
Pesticide Occurrence in Groundwater	Agricultural Practices – Pesticide use	No	2004-2009	No
Anoxic Events in Estuaries	Surface Water Quality – Dissolved oxygen concentrations	No	2002-2010	No
Nitrate Concentration in Surface Water	Surface Water Quality – Nitrogen concentrations	Maintain nitrate concentration below the Canadian Aquatic Life Guideline of 2.9 mg/L	1971-2005	No
pH in Surface Water	No	Maintain pH concentrations in Island streams within the Canadian Water Quality Guideline for the Protection of Aquatic Life for pH of between 6.5 and 9.0	1976-2008	No
Shellfish Closures	Surface Water Quality – Coliform	No	1998-2008	No
Siltation of Watercourses and	No	No	No	No

Wetlands				
Greenhouse Gas Emissions	Air Emissions – Greenhouse gas emissions	Reduce greenhouse gas emissions to 1990 levels (1,981 kt CO ₂ e) by 2010, and to 75 to 85 per cent below 2001 levels by 2050	1990-2008	Canada
Rise in Sea Level	No	No	1911-2009	No
Household Electrical Use	Natural Resource Consumption – Energy consumption	No	1995-2009	No
Gasoline Consumption	Transportation – Private transportation use	No	1965-2008	No
Wood Burned for Residential Heating	Natural Resource Consumption – Energy consumption	No	1973-2010	No
Acid Rain	No	No	1994-2009	No
Particulate Matter	Air Quality – Particulates	Remain under the Canada-wide Standard objective for particulate matter (PM _{2.5}) of 30 µg per m ³ averaged over 24 hours.	1994-2009	No
Ground Level Ozone	Air Quality – Ozone concentrations	To be below the Canada-wide Standard objective for ozone of 65 ppb	2001-2009	No
Forest Communities	Protecting Nature – Biodiversity	No	1990-200	No
Forest Covertypes	Protecting Nature – Biodiversity	No	1980-2000	No
Protected Land Area (hectares)	Protecting Nature – Protected areas	Protect seven per cent of PEI's land mass comprised of habitat types that are representative of the natural areas found in the province	1991-2010	No

Species Number	Protecting Nature – Biodiversity	No	2003, 2007	No
Fish Kills	Agriculture Practices – Pesticide use	No pesticide related fish kills	1994-2010	No
Pesticide Sales	Agriculture Practices – Pesticide use	No	1993-2008	No
Solid Waste Diverted Away from Disposal by Burial and Incineration	Waste Generation and Treatment – Municipal Waste	No	1989-2009	No
Home Heat Oil Tank Compliance	No	Maintain 100 per cent compliance with home heat tank regulations	2002-2008	No
Community Watershed Planning	No	40 per cent of the province's land base under holistic community watershed plans by 2013	No	No
People Taking Public Transportation	Transportation – Public transit use	No	2005-2009	No
Participation in Angling, Hunting and Trapping	Protecting Nature – Fisheries harvest	No	1987-2009	No
Frequency of Row Crops	No	Only permit row crops ¹⁵ to be grown on land one year in every three or equivalent soil conservation practices	1997-2008	No
Area Under Soil Conservation Management Structures	No	Work toward adding a further 7,000 hectares of row-cropped land under engineered soil conservation structures by 2014.	1995-2009	No
Soil Organic Matter	No	No	1999-2008	No
Organic Agriculture	Agricultural Practices – Pesticide use,	Minimum target of 2,500 organically managed hectares	2001-2009	No

	Fertilizer use	and 60 farmers involved in organic production by 2010		
Environmental Farm Plans	No	Have 60 per cent of the agricultural land base in Prince Edward Island with a valid EFP	1996-2009	No
Land Area in Agricultural Crop Production	No	No	1981-2006	No
Forest Conversions	No	No net loss of forest area	1990-2000	No
Total Indicators Used	Total Categories Covered	Total Targets	Total Trends	Total Comparable Jurisdictions
35	13/42	16/35	32/35	1/35

9. Is there a mandatory review and revision of the environmental sustainability planning system based on the monitoring results?

Not met. There is no comprehensive review mandated within the government.

Newfoundland and Labrador

1. Is monitoring information available in a comprehensive report and/or website?

No, Newfoundland and Labrador does not publish a comprehensive environmental sustainability report. The province does however make monitoring information available through other means.

2. Is there a regular public monitoring report measuring sustainability progress?

No.

3. Is there a clear mandate for regular environmental sustainability reporting?

No.

4. a. Is the environmental sustainability monitoring report prepared by an independent agency?

No.

b. Is progress monitoring performed by an independent agency?

Yes, by the Auditor General of Newfoundland and Labrador.

Table 2. Environmental sustainability monitoring reporting by an independent agency

Yes or No	Yes
What is the name of the agency?	Auditor General of Newfoundland and Labrador
List the most recent reports	<ul style="list-style-type: none"> • Pesticides Control (2012) • Forest Industry Diversification Program (2012) • Canada-Newfoundland and Labrador Offshore Petroleum Board (2012) • Mineral Incentive Program (2011) • Environment and Conservation, Industrial Compliance (2011) • Monitoring Air Quality in Schools (follow-up) (2011) • Oil Royalties (follow-up) (2011) • Fisheries Technology and New Opportunities Program (follow-up) (2011) • Aquaculture Inspections (follow-up) (2011) • Aquaculture Development (follow-up) (2011) • Administration and Management of Crown Lands (follow-up) (2011) • Newfoundland and Labrador Waste Management Trust Fund (follow-

	<ul style="list-style-type: none"> up) (2011) • Used Beverage Container Recycling Program (follow-up) (2011) • Petroleum Storage Systems (follow-up) (2011) • Contaminated Sites (2010) • Fisheries Compliance and Enforcement (2010) • Forestry Management (2010) • Monitoring Air Quality in Schools (follow-up) (2010) • Used Tire Recycling Program (follow-up) (2010) • Used Beverage Container Recycling Program (follow-up) (2010) • Newfoundland and Labrador Waste Management Trust Fund (follow-up) (2010) • Petroleum Storage Systems (follow-up) (2010) • Aquaculture Development (follow-up) (2010) • Administration and Management of Crown Lands (follow-up) (2009) • Fisheries Technology and New Opportunities Program (follow-up) (2009) • Newfoundland and Labrador Gas Tax Fund (2009) • Petroleum Storage Tanks (follow-up) (2009) • Water Quality Management (follow-up) (2009) • Aquaculture Inspections (2009) • Aquaculture Development (2009) • Monitoring Air Quality in Schools (2008) • Solid Waste Management (follow-up) (2008) • <i>Mining Act</i> (follow-up) (2008) • Aquaculture Program (follow-up) (2007) • Water Quality Management (follow-up) (2007) • Used Tire Recycling Program (follow-up) (2007) • Solid Waste Management (follow-up) (2007) • Contaminated Sites (follow-up) (2007) • Inland Fish and Games Licenses (follow-up) (2006) • Petroleum Storage Systems (2005)
--	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

5. What proportion of the 42 environmental categories is included in the monitoring report?

Not applicable.

6. What proportion of the environmental indicators used by the jurisdiction is assessed relative to targets?

Not applicable.

7. What proportion of the environmental indicators used by the jurisdiction is assessed relative to trends?

Not applicable.

8. What proportion of the environmental indicators used by the jurisdiction is assessed relative to comparable jurisdictions?

Not applicable.

9. Is there a mandatory review and revision of the environmental sustainability planning system based on the monitoring results?

Not met.

Yukon Territory

1. Is monitoring information available in a comprehensive report and/or website?

Yes. See Table 1.

Table 1. Public environmental sustainability monitoring reports

Does the province publish an environmental sustainability monitoring report?	Yes
Report name	State of the Environment Report
Year of publication	2013
Other reports of note	State of the Environment Report 1999 (2000), 2000 (2001), 2001 (2002), 2002 (2002), 2003 (2007), 2004 (2007), 2005 (2008), 2006 (2009), 2007 (2010) and 2008 (2011) Status of Yukon Fisheries 2010

2. Is there a regular public monitoring report measuring sustainability progress?

Yes, the Yukon last published a report in 2013.

3. Is there a clear mandate for regular environmental sustainability reporting?

Yes. The *Yukon Environmental Act* (2002) mandates the government to report publicly on the state of the environment every three years (s.48(1)) and to prepare interim reports for each year where a full report is not published (s.50(1)).

4. a. Is the environmental sustainability monitoring report prepared by an independent agency?

No.

b. Is progress monitoring performed by an independent agency?

Yes, by the Yukon Government Audit Services and the Office of the Auditor General of Canada, however the auditors have only addressed a limited number of environmental issues. See Table 2.

Table 2. Environmental sustainability monitoring reporting by an independent agency

Yes or No	Partial (limited number of environmental issues addressed)
-----------	------------------------------------------------------------

What is the name of the agency?	Yukon Government Audit Services Office of the Auditor General of Canada
List the most recent reports	<p>Government Audit Services</p> <ul style="list-style-type: none"> • Report on the Yukon Government 's Performance under the Environment Act (2006-2009) (2010) • Report on the Yukon Government's Performance under the Environment Act (2003-2006) (2008) • Audit of the Yukon Government's Performance under the Environment Act (2000-2003) (2005) <p>Office of the Auditor General of Canada</p> <p>While the Yukon Act 2002 establishes the powers for an auditor general of Yukon, the Office of the Auditor General of Canada is the auditor for the governments of Nunavut, the Yukon, and the Northwest Territories and, as such, reports directly to their legislative assemblies. None of the OAG Audits to the Legislative Assembly of Yukon pertain to environmental sustainability.</p>

5. What proportion of the 42 environmental categories is included in the monitoring report?

Nine of 42 environmental categories are included in the monitoring report. See Table 3.

6. What proportion of the environmental indicators used by the jurisdiction is assessed relative to targets?

Four of the 42 indicators used in the report is assessed relative to targets. See Table 3.

7. What proportion of the environmental indicators used by the jurisdiction is assessed relative to trends?

Ten of the 42 indicators used in the report are assessed relative to trends. See Table 3.

8. What proportion of the environmental indicators used by the jurisdiction is assessed relative to comparable jurisdictions?

Four of 22 indicators used in the report are assessed relative to comparable jurisdictions. See Table 3.

Table 3. Environmental categories included in the report and assessed relative to targets, trends and other jurisdictions. Partial targets are included in grey but were not counted towards the total.

Indicators	Corresponding environmental category	Target	Trend (years of data)	Comparable jurisdiction
Greenhouse Gas Emissions	Pollution Emissions – GHG emissions	20% GHG emission reduction below 2010 levels by 2015	1990-2010	Canada
Long term trend in temperature variation	No	No	1948-2011	Canada
Amount of precipitation in winter	No	No	No	No
Number of extreme weather events	No	No	No	No
Average ambient annual PM2.5 levels in the City of Whitehorse	Air Quality – Particulates concentration	Yukon's Ambient Air Quality Standard of 30 micrograms/m3 (adopted from the Canada Wide Standard for Particulate Matter)	2001-2011	Smithers, BC, Canada
Canadian Water Quality Index	Surface Water Quality – (See NOV APPENDICES)	No	2008-2010	No
Status of management plans related to land use, resources and protected areas	Protecting Nature – Protected Areas	No	No	No
Status of parks and other protected areas in Yukon	Protecting Nature – Protected Areas	No	No	No
Total annual tonnage of waste being handled at the City of Whitehorse Waste Management	Waste Generation and Treatment – Municipal waste	No	2000-2011	No

Facility				
Whitehorse waste diverted through recycling and composting compared to waste generated	Waste Generation and Treatment - Recycling	50% waste diversion by 2015	2000-2011	No
Curbside collection of garbage and organics from single family households in Whitehorse	No	No	2000-2011	No
Returns of spawning Chinook salmon in the Canadian portion of the upper Yukon River drainage	Protecting Nature – Species at Risk	No	1982-2012	No
Status of lake trout fisheries in Yukon	Protecting Nature – Fisheries harvest	Sustainable level of lake trout harvest	No	No
Status of caribou herds in Yukon	Protecting Nature – Species at Risk	No	No	No
Status of community-based wildlife plans and species plans	No	No	No	No
Mercury levels in Yukon caribou	Protecting Nature – Species at Risk	No	1994-2011	No
Cadmium levels in Yukon caribou and moose	Protecting Nature – Species at Risk	No	"Last 15 years"	No
Number of species at risk in Yukon	Protecting Nature – Species at Risk	No	No	Canada, NWT, PEI
Total Indicators Used	Total Categories Covered	Total Targets	Total Trends	Total Comparable Jurisdictions
22	9/42	4/22	10/22	4/22

9. Is there a mandatory review and revision of the environmental sustainability planning system based on the monitoring results?

Not met.

Northwest Territories

1. Is monitoring information available in a comprehensive report and/or website?

Yes. See Table 1.

Table 1. Public environmental sustainability monitoring reports

Does the province publish an environmental sustainability monitoring report?	Yes
Report name	State of the Environment Report
Year of publication	2009
Other reports of note	The NWT State of the Environment Report - Biodiversity Special Edition (2010) Mackenzie River Basin Board - State of the Aquatic Ecosystem Report on the Mackenzie River Basin (2003)

2. Is there a regular public monitoring report measuring sustainability progress?

Largely met. The government last published a report in 2009.

3. Is there a clear mandate for regular environmental sustainability reporting?

No.

4. a. Is the environmental sustainability monitoring report prepared by an independent agency?

No.

b. Is progress monitoring performed by an independent agency?

Yes, by the NWT Environmental Audit and the Office of the Auditor General of Canada.

Table 2. Environmental sustainability monitoring reporting by an independent agency

Yes or No	Partial (limited number of environmental issues addressed)
What is the name of the agency?	NWT Environmental Audit Office of the Auditor General of Canada

List the most recent reports	<p>The Northwest Territories Environmental Audit</p> <p>The Northwest Territories Environmental Audit is a requirement under Part VI of the <i>Mackenzie Valley Resource Management Act</i> and must be conducted every five years.</p> <ul style="list-style-type: none"> • NWT Mackenzie Valley Environmental Audit (2010) • NWT Mackenzie Valley Environmental Audit (2005) <p>The audit is an independent review of:</p> <ul style="list-style-type: none"> - information to determine trends in environmental quality; - factors contributing to environmental change; - the effectiveness of the NWT CIMP; - the effectiveness of land, water and waste regulations on the protection of key environmental components; and - responses to the recommendations of previous environmental audits. <p>The audit is required by the Sahtu, Gwich'in and Tlicho final agreements and by the Mackenzie Valley Resource Management Act.</p> <p>Auditor General of Canada</p> <p>The Office of the Auditor General of Canada is the auditor for the government of the Northwest Territories and, as such, reports directly to their legislative assemblies. The Office of the Auditor General of Canada has not reported on environmental sustainability in Nunavut since 2004.</p>
------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

5. What proportion of the 42 environmental categories is included in the monitoring report?

Eleven of 42 environmental categories are included in the monitoring report. See Table 3.

6. What proportion of the environmental indicators used by the jurisdiction is assessed relative to targets?

Two of the 69 indicators used in the report is assessed relative to targets. See Table 3.

7. What proportion of the environmental indicators used by the jurisdiction is assessed relative to trends?

Forty-five of the 69 indicators used in the report is assessed relative to targets. See Table 3.

8. What proportion of the environmental indicators used by the jurisdiction is assessed relative to comparable jurisdictions?

Sixteen of the 69 indicators used in the report is assessed relative to targets. See Table 3.

Table 3. Environmental categories included in the report and assessed relative to targets, trends and other jurisdictions. Partial targets are included in grey but were not counted towards the total.

Indicators	Corresponding environmental category	Target	Trend	Comparable jurisdiction
Trends in global greenhouse gas concentrations	Polluting Emissions – GHG emissions	No	0-2005, 1975-2010	Global, Nunavut
Trends in average global temperature, sea levels and snow cover	No	No	1850-2005	No
Projected trends in temperature and precipitation in the Arctic	No	No	1900-2100 (projection)	No
Trends in Arctic sea ice	No	No	1953-2010	No
Trends in global population numbers	No	No	1950-2005	No
Trends in global supply and demand for northern natural resources	No	No	1990-2008	No
Projected trends in Beaufort Sea levels	No	No	Projection (2010-2100)	Iqaluit, Arviat, Whale Cove
Arctic Oscillation Index	No	No	1950-2010	No
Pacific Decadal Oscillation Index and El Niño/ La Niña	No	No	1900-2008, 1950-2010	No
Trends in observed seasonal weather compared to normal	No	No	1948-2011	Canada
Trends in demography in NWT ecozones	No	No	1999-2012, 1987-2012	Canada, Yukon, Nunavut
Trends in use of Aboriginal languages in each NWT ecozone	No	No	1984-2009	No
Trends in Gross	No	No	1999-2011	Canada, Nunavut,

Domestic Product				Yukon, Alberta
Trends in oil-gas and mineral production by ecozone	No	No	1989-2011, 1997-2011, 1988-2011, 1993-2011	No
Trends in total energy development	No	No	2001-2009	No
Trends in electrical generation	Natural Resource Consumption – Energy consumption	No	2001-2009	No
Trends in NWT greenhouse gas emissions	Pollution Emissions – GHG emissions	Emissions stabilized at or below 2005 levels by 2015	1999-2009	No
Trends in air traffic	No	No	2000-2011	Yukon
Trends in road traffic	Transportation – Private transportation use	No	1998-2008	No
Trends in shipping in the Northwest Passage and the Beaufort Sea	No	No	1906-2011	No
Trends in development activities requiring a permit in the NWT	No	No	1981-2011, 2003-2010, 2000-2011	No
Road density and other maintained linear features	No	No	No	Alaska, British Columbia
Seismic line density	No	No	No	No
Area of commercial harvest	Protecting Nature – Forest harvest	No	1975-2009	Yukon, Alberta, British Columbia
Trends in percentage of beverage containers that are returned for reuse and recycling	Waste Generation and Treatment – Recycling	No	No	No
Trends in Single-use Retail Bag (SRB) distribution	Waste Generation and Treatment – Municipal Waste	No	No	No
Trends in cadmium and mercury in caribou kidneys	No	No	1992-2008	No
Trends in environmental remediation of	No	No	2003-2010, 1992-2012	No

contaminated sites				
Trends in spills of hazardous material	No	No	1990-2010	No
Trends in winter flow in NWT Rivers	Natural Resource Consumption – Water consumption	No	~1970-2012	Canada
Trends in Slave River Flows	Natural Resource Consumption – Water consumption	No	1980-2010	No
Trends in Great Slave Lake levels	Natural Resource Consumption – Water consumption	No	1941-2010	No
Trends in turbidity and arsenic in the Hay River	Water Quality – Turbidity	5 µg/L threshold	1988-2010	No
Criteria Air Contaminants Indicator	Air Quality (SEE NOV APPENDIX)	No	1995-2010	No
Ground temperature in permafrost	No	No	1984-2003	No
Trends in thermokarst in the NWT	No	No	No	No
Land Cover Types by Ecozone	Protecting Nature – Biodiversity	No	No	No
Position of treeline	No	No	No	No
Annual area burned and number of fires	No	No	1990-2012	British Columbia, Alberta, Ontario
Trends in alien plant species	Protecting Nature – Biodiversity	No	2005, 2010	Nunavut, Yukon, British Columbia
Status of species harmful to forests in the NWT	Protecting Nature – Biodiversity	No	No	No
Trends in willow ptarmigan and grouse in tundra-taiga ecosystems	Protecting Nature – Biodiversity	No	1984-2010	No
Trends in small mammals and hares in NWT ecosystems	Protecting Nature – Biodiversity	No	1990-2012, 1988-2012, 1958-2012	No
Trends in Dall's sheep in mountain ecosystems	Protecting Nature – Biodiversity	No	1973-2000, 1995-2006	Yukon
Trends in barren-ground caribou population size in tundra-taiga	Protecting Nature – Biodiversity	No	1982-2010	Northern Canada

ecosystems				
Trends in range expansions of mammals	Protecting Nature – Biodiversity	No	No	No
Trends in number of introduced and alien mammals, birds and fish	Protecting Nature – Biodiversity	No	No	No
Trends in winter tick in moose	Protecting Nature – Biodiversity	No	1987, 2011	No
Trends in bird populations	Protecting Nature – Biodiversity	No	1973-2010	No
State of Dolly varden and bull trout	Protecting Nature – Biodiversity	No	1989-1998, 1986-2000	No (short, descriptive)
Trends in the Species At Risk Index	Protecting Nature – Species at Risk	No	1900-2010	No
Trends in populations of NWT species at risk	Protecting Nature – Species at Risk	No	No	No
Status of Peary Caribou in a changing climate	Protecting Nature – Species at Risk	No	1950-1997	No
Status of Peregrine Falcon in a less contaminated world	Protecting Nature – Species at Risk	No	1970-2010	No
Status of Polar Bear with changing sea ice	Protecting Nature – Species at Risk	No	No	US
Status of woodland caribous in a changing landscape	Protecting Nature – Species at Risk	No	No	No
Status of endemic and rare species in the NWT	Protecting Nature – Biodiversity	No	No	No
Trend in volume of timber harvest	Protecting Nature – Forest harvest	No	1980-2010	No
Trends in field environmental education opportunities for Youth	No	No	No	No
Trends in Participation in Environmental Programs	No	No	No	No
Protected Areas and Land Use Plans	Protecting Nature – Protected areas	No	2007, 2012	No
Total Indicators Used	Total Categories Covered	Total Targets	Total Trends	Total Comparable Jurisdictions
69	11/42	2/69	45/69	16/69

9. Is there a mandatory review and revision of the environmental sustainability planning system based on the monitoring results?

Not met.

Nunavut

1. Is monitoring information available in a comprehensive report and/or website?

No. Nunavut does not publish a comprehensive environmental sustainability report. The territory does however make monitoring information available through other means.

2. Is there a regular public monitoring report measuring sustainability progress?

No.

3. Is there a clear mandate for regular environmental sustainability reporting?

No.

4. a. Is the environmental sustainability monitoring report prepared by an independent agency?

No.

b. Is progress monitoring performed by an independent agency?

No. The Office of the Auditor General of Canada is the auditor for the government of Nunavut. The Office of the Auditor General of Canada has not reported on environmental sustainability in Nunavut since 2001.

5. What proportion of the 42 environmental categories is included in the monitoring report?

Not applicable.

6. What proportion of the environmental indicators used by the jurisdiction is assessed relative to targets?

Not applicable.

7. What proportion of the environmental indicators used by the jurisdiction is assessed relative to trends?

Not applicable.

8. What proportion of the environmental indicators used by the jurisdiction is assessed relative to comparable jurisdictions?

Not applicable.

9. Is there a mandatory review and revision of the environmental sustainability planning system based on the monitoring results?

Not met.

Canada

1. Is monitoring information available in a comprehensive report and/or website?

Yes. See Table 1.

Table 1. Public environmental sustainability monitoring reports

Does the province publish an environmental sustainability monitoring report?	Yes
Report name	Canadian Environmental Sustainability Indicators (CESI)
Year of publication	Online, continuously updated
Other reports of note	-

2. Is there a regular public monitoring report measuring sustainability progress?

Yes, the CESI report is regularly updated.

3. Is there a clear mandate for regular environmental sustainability reporting?

Yes, Section 7(2) of the *Federal Sustainable Development Act* requires that the Sustainable Development Office “shall, at least once every three years after the day on which this Act comes into force, provide the Minister with a report on the progress of the federal government in implementing the Federal Sustainable Development Strategy”. Associated policy directives have outlined the contents of these reports, however specific guidance on what should be reported on is not enshrined in law. Under the *Canadian Environmental Protection Act*, monitoring of environmental quality is required (s.44), as well as establishing a national inventory of releases of pollutants (s.48). The *Canadian Environmental Assessment Act* mandates monitoring to ensure quality of assessment and to ensure compliance of the Act.

4. a. Is the environmental sustainability monitoring report prepared by an independent agency?

No.

b. Is progress monitoring performed by an independent agency?

Yes, by the Commissioner of Environment and Sustainable Development.

Table 2. Environmental sustainability monitoring reporting by an independent agency

Yes or No	Yes
What is the name of the agency?	Commissioner of Environment and Sustainable Development
List the most recent reports	<p>Federal Contaminated Sites and Their Impacts (2012)</p> <p>Meeting Canada's 2020 Climate Change Commitments (2012)</p> <p>Kyoto Protocol Implementation Act (2012)</p> <p>Oversight of Civil Aviation – Transport Canada (2012)</p> <p>Enforcing the Canadian Environmental Protection Act, 1999 (2011)</p> <p>Environmental Science (2011)</p> <p>Transportation of Dangerous Products (2011)</p> <p>Assessing Cumulative Environmental Effects of Oil Sands Projects (2011)</p> <p>Climate Change Plans Under the Kyoto Protocol Implementation Act (2011)</p> <p>Oil Spills from Ships (2010)</p> <p>Monitoring Water Resources (2010)</p> <p>Adapting to Climate Impacts (2010)</p> <p>Applying the Canadian Environmental Assessment Act (follow-up) (2009)</p> <p>Risks of Toxic Substances (2009)</p> <p>National Pollutant Release Inventory (2009)</p> <p>Protecting Fish Habitat (follow-up) (2009)</p> <p>Kyoto Protocol Implementation Act (2009)</p> <p>Safety of Drinking Water (follow-up) (2009)</p> <p>Air Quality Health Index—Health Canada and Environment Canada (2009)</p> <p>Managing Air Emissions (follow-up) (2008)</p> <p>Managing Severe Weather Warnings—Environment Canada (2008)</p> <p>Managing Environmental Programming—Agriculture and Agri-Food Canada (2008)</p> <p>Annual Report on Sustainable Development Strategies (2008)</p> <p>Managing Risks to Canada's Plant Resources—Canadian Food Inspection Agency (2008)</p> <p>Chemicals Management—Substances Assessed under the Canadian Environmental Protection Act, 1999 (follow-up) (2008)</p> <p>Chemicals Management—Pesticide Safety and Accessibility (follow-up) (2008)</p> <p>Chemicals Management—Federal Contaminated Sites (follow-up) (2008)</p> <p>Ecosystems-Federal Protected Areas for Wildlife (follow-up) (2008)</p> <p>Ecosystems—Protection of Species at Risk (follow-up) (2008)</p> <p>Ecosystems—Control of Aquatic Invasive Species (follow up) (2008)</p>

	<p>Ecosystems—Areas of Concern in the Great Lakes Basin (follow-up) (2008)</p> <p>Management Tools and Government Commitments—International Environmental Agreements (follow-up) (2008)</p> <p>Management Tools and Government Commitments—Strategic Environmental Assessment (follow-up) (2008)</p> <p>Management Tools and Government Commitments—Greening of Government Operations (follow-up) (2008)</p> <p>Previous Audits of Responses to Environmental Petitions—Insurance for Nuclear Operators (follow-up) (2008)</p> <p>Previous Audits of Responses to Environmental Petitions—Listing of Species at Risk (follow-up) (2008)</p> <p>Previous Audits of Responses to Environmental Petitions—Military Dumpsites (follow-up) (2008)</p> <p>Previous Audits of Responses to Environmental Petitions—Genetically Engineered Fish (follow-up) (2008)</p> <p>Sustainable Development Strategies (2007)</p> <p>Environmental Petitions: Retrospective and Annual Report (2007)</p> <p>Adapting to the Impacts of Climate Change (2006)</p> <p>Reducing Greenhouse Gases Emitted During Energy Production and Consumption (2006)</p> <p>Sustainable Development Strategies (2006)</p> <p>Environmental Petitions (report and audit) (2006)</p> <p>Fisheries and Oceans Canada—Canada’s Oceans Management Strategy (2005)</p> <p>Ecological Integrity in Canada’s National Parks (2005)</p> <p>Canadian Biodiversity Strategy (follow-up) (2005)</p> <p>Safety of Drinking Water: Federal Responsibilities (2005)</p> <p>Drinking Water in First Nations Communities (2005)</p> <p>Green Procurement (2005)</p> <p>Sustainable Development Strategies (2005)</p> <p>Environmental Petitions (2005)</p>
--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

5. What proportion of the 42 environmental categories is included in the monitoring report?

Twenty-four of 42 environmental categories are included in the monitoring report. See Table 3.

6. What proportion of the environmental indicators used by the jurisdiction is assessed relative to targets?

Five of the 54 indicators used in the report is assessed relative to targets. See Table 3.

7. What proportion of the environmental indicators used by the jurisdiction is assessed relative to trends?

Forty-one of 54 indicators used in the report is assessed relative to targets. See Table 3.

8. What proportion of the environmental indicators used by the jurisdiction is assessed relative to comparable jurisdictions?

Fifteen of 54 indicators used in the report is assessed relative to targets. See Table 3.

Table 3. Environmental categories included in the report and assessed relative to targets, trends and other jurisdictions. Partial targets are included in grey but were not counted towards the total.

Indicators	Corresponding environmental category	Target	Trend	Comparable jurisdiction
Air Quality – Fine Particulate Matter	Air Quality – Particulate concentrations	24-hour standard for 2015 (28 ug/m3)	2000-2011	International urban areas
Air Quality – Ozone	Air Quality – Ozone concentrations	8-hour standard for 2015 (63 ppb)	1997-2011	International urban areas
Air Quality – Sulphur Dioxide	Air Quality – Sulfur concentrations	No	1997-2011	International urban areas
Air Quality – Nitrogen Dioxide	Air Quality – Nitrogen dioxide	No	1997-2011	International urban areas
Air Quality – Volatile Organic Compounds	Air Quality – Volatile Organic Compounds	No	1997-2011	No
Air Emissions – Sulphur Oxide Emissions	Pollution Emissions – Sulfur oxide	No	1990-2011	Nine industrialized countries
Air Emissions – Nitrogen Oxide Emissions	Pollution Emissions – Nitrogen	No	1990-2011	Nine industrialized countries
Air Emissions – Volatile Organic Compound	Pollution Emissions – VOCs	No	1990-2011	Nine industrialized

Emissions				countries
Air Emissions – Ammonia emissions	No	No	1990-2011	Nine industrialized countries
Air Emissions – Carbon Monoxide	Pollution Emissions – Carbon monoxide	No	1990-2011	No
Air Emissions – Particulate Matter Emissions	Pollution Emissions - Particulate	No	1990-2011	No
Toxic Substances – Mercury Emissions to Air	No	No	1990-2011	Global regions
Toxic Substances – Hexavalent chromium emissions to air	No	No	2003-2011	No
Greenhouse Gases – Greenhouse Gas Emissions	Pollution Emissions – Greenhouse gas emissions	Copenhagen target: 17% below 2005 emissions level	1990-2011	Major emitting countries
Weather – Weather Warming Index	No	No	2009-2012	No
Air Health Indicator – Ozone and Fine Particulate Matter	Air Quality – Ozone concentrations, Particulate concentrations	No	1990-2008	No
Air Health Indicator – Levels of Exposure to Substances of Concern	No	No	2007-2011	No
Water Quantity and Availability – Water Quantity in Canadian Rivers	Natural Resource Consumption – Water consumption	No	2001-2010	Selected countries
Water Quantity and Availability – Water Availability in Canada	Natural Resource Consumption – Water consumption	No	No	No
Water Quantity and Availability – Residential Water Use Indicator	Natural Resource Consumption – Water consumption	No	1991-2009	No
Water Quantity and Availability – Water withdrawal by sector in Canada	Natural Resource Consumption – Water consumption	No	2004-2009	No
Water Quality – Freshwater Quality in	Surface Water Quality – Heavy metals,	No	2003-2010	Selected industrialized

Canadian Rivers	Phosphorus concentrations, Nitrogen concentrations, Dissolved oxygen concentrations, Biochemical oxygen demand, Suspended solids, Coliform (CHECK NOV APPENDICES)			countries
Water Quality – Shellfish Growing Area Quality	No	No	2006-2010	No
Water Quality – Polybrominated Diphenyl Ethers (PBDEs) in Fish and Sediment	No	No	1997-2010, 1997-2011	No
Water Quality – Perfluorooctane Sulfonate (PFOS) in Fish and Water	No	No	2006-2010	No
Water Quality – Drinking Water Advisories in Canada	No	No	2010-2012	No
Regional Ecosystems – Restoring the Great Lakes Areas of Concern	No	No	1987-2012	No
Regional Ecosystems – Phosphorus Levels	Surface Water Quality – Phosphorus	No	1970-2010, 2008-2011, 2008-2010	No
Pressures on Water Quality – Land Use Impacts	No	No	No	No
Pressures on Water Quality – Household Use of Chemical Pesticides and Fertilizers	Agricultural Practices – Pesticide use, Fertilizer use (CHECK NOV APPENDIX)	No	1994-2009	No
Pressures on Water Quality – Municipal Wastewater Treatment	Waste Generation and Treatment – Sewage treatment	No	1983-2009	No
Pressures on Water Quality – Soil and Water Quality for Agriculture	No	Achieve the desired level in these performance	1981-2006	No

		indices by 2030		
Pressures on Water Quality – Releases of Mercury to Water	No	No	2003-2011	No
Pressures on Water Quality – Releases of Lead to Water	No	No	2003-2011	No
Pressures on Water Quality – Releases of Cadmium to Water	No	No	2003-2011	No
Pressures on Water Quality – Managing Disposal at Sea	No	No	2001-2010	No
Habitat Protection – Canada’s Protected Areas	Protecting Nature – Protected areas	Set aside at least 17% of terrestrial areas and inland waters and at least 10% of marine areas, by 2020	1990-2012	Selected countries
Habitat Protection – Conserved Areas in Marine and Great Lakes Waters	Protecting Nature – Protected areas	No	No	No
Habitat Protection – Ecological Integrity of National Parks	No	No	Descriptive	No
Habitat Protection – Habitat Secured for Waterfowl	Protecting Nature – Protected areas	No	1990-2012	No
Habitat Protection – Habitat Secured for Species at Risk	Protecting Nature – Species at risk	No	2000-2011	No
Habitat Protection – Status of key findings related to the health of Canada’s ecosystems	No	No	No	No
Wildlife – Changes in risk of wildlife species disappearance	Protecting Nature – Species at risk	No	No	No
Wildlife – General Status of Species in Canada	Protecting Nature – Biodiversity	No	No	No

Wildlife – Species at Risk Population Trends	Protecting Nature – Species at risk	No	No	No
Wildlife – Trends in Migratory Bird Populations	Protecting Nature – Biodiversity	No	1970-2010	United States, Central America, South America
Wildlife – Global Trends in Bird Species Survival	Protecting Nature – Biodiversity	No	1988-2008	Global
Biological Resources – Sustainable Fish Harvest	Protecting Nature – Fisheries harvest	No	No	No
Biological Resources – Status of Major Fish Stocks	Protecting Nature – Fisheries harvest	No	No	No
Biological Resources – Sustainability of Timber Harvest	Protecting Nature – Forest harvest	No	1990-2010	No
Total Indicators Used	Total Categories Covered	Total Targets	Total Trends	Total Comparable Jurisdictions
54	24/42	5/54	41/54	15/54

9. Is there a mandatory review and revision of the environmental sustainability planning system based on the monitoring results?

Partially met. The Minister of the Environment is charged with producing a new Federal Sustainable Development Strategy once every three years, however there is no mandatory requirement that the new strategy address deficiencies identified in progress monitoring. The Office of the Commissioner of Environment and Sustainable Development provides recommendations for improvement. The updated strategy may take into consideration these recommendations, however, it is not a mandatory requirement. The FSDS policy uses a “Plan, Do, Check, Improve” system, which supports an adaptive management approach.