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Managing climate risks **HIGHLIGHTS FOR BUSINESS LEADERS**





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About this report

This report includes selected findings from the 2014 science assessment by the Canadian government *Canada in a Changing Climate: Sector Perspectives on Impacts and Adaptation*. The report was prepared for Natural Resources Canada by J. Eyzaguirre (Essa Technologies Ltd.) and benefited from feedback from the following reviewers: A. DeJong (Whistler Blackcomb), P. Kovacs (Institute for Catastrophic Loss Reduction), S. Lacombe (Rio Tinto), P. Laughland (Network for Business Sustainability) and Dr. R. Page (University of Calgary).

The peer-reviewed and fully referenced assessment is available at <https://www.nrcan.gc.ca/environment/resources/publications/impacts-adaptation/reports/assessments/2014/16309>.

For a detailed review of a) climate trends and projections for Canada; b) risks, opportunities and adaptation in goods and services industries and public good sectors; and c) barriers and enablers to climate adaptation, see the following chapters of the assessment:

Synthesis: Canada in a Changing Climate: Sector Perspectives on Impacts and Adaptation
Chapter 2: An Overview of Canada's Changing Climate
Chapter 3: Natural Resources (Forestry, Mining, Energy)
Chapter 4: Food Production (Agriculture and Fisheries)
Chapter 5: Industry (Insurance, Tourism, Residential Construction, Manufacturing, Trade)
Chapter 6: Biodiversity and Protected Areas
Chapter 7: Human Health
Chapter 8: Water and Transportation Infrastructure
Chapter 9: Adaptation: Linking Research and Practice

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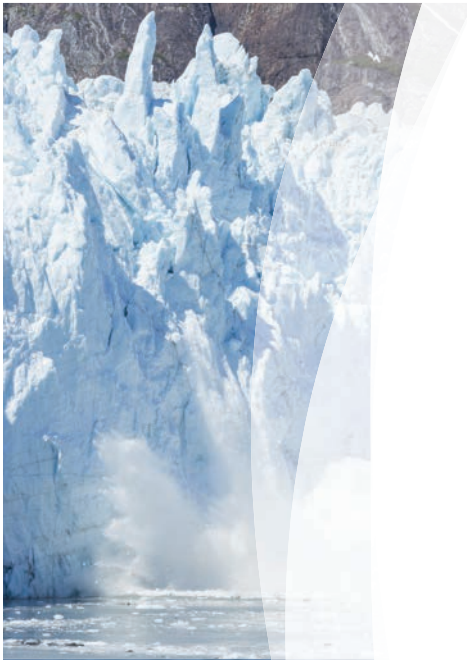
This publication is also available at
adaptation.nrcan.gc.ca.

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points essentiels pour les chefs d'entreprise*

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This report is for business leaders looking ahead. It explains why acting now to prepare for future climate realities makes good business sense. The report draws from the most up-to-date analysis of climate change impacts, risks and responses across Canadian sectors and highlights approaches and resources to enhance climate resilience.

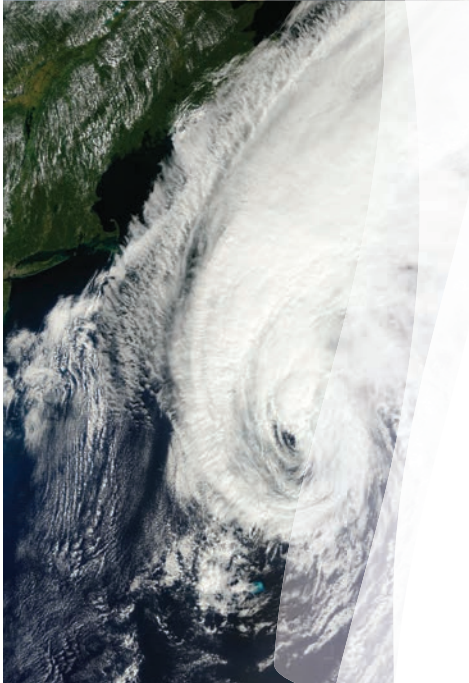
The climate is already changing and will continue to change



Climate change is happening.¹ So far, the 21st century is notable for including 12 of the 13 warmest years on the global record. Since the beginning of the 20th century, almost every decade is warmer than the previous one. Scientists conclude that carbon emissions from burning fossil fuels and changes in land use are the main causes of the rise in global temperatures since the mid-20th century.

In Canada, temperatures over land have increased by 1.5°C since 1950, which is about double the rate of warming globally. Scientists expect warming and other associated changes to continue and possibly accelerate for decades – if not centuries (see Figure 1). Society's exposure to climate risk will grow as climate change intensifies.

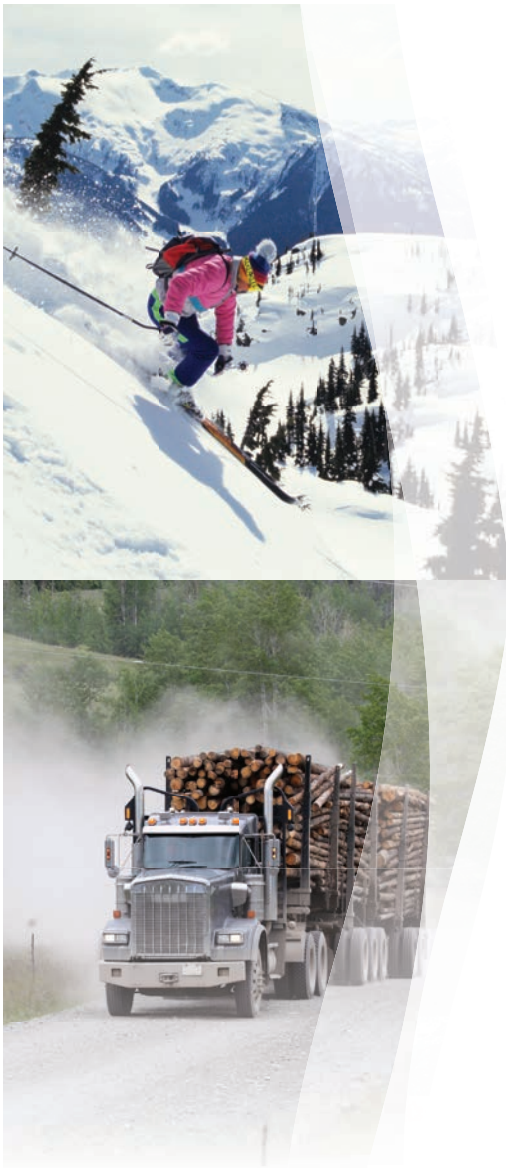
Changing weather and climate patterns are transforming the business landscape. Global trade networks, local business operations and everything in between are affected by the effects of the changing climate. Climate change has both direct impacts on company operations and indirect impacts such as disruptions in supply chains and shifts in customer preferences and stakeholder expectations. Canada's largest companies increasingly identify the impacts of climate change as near-term risks to their business.²



Climate change means much more than just warmer weather. Shifting patterns of rainfall and snowfall, shrinking glaciers, declining snow cover and sea ice extent, rising sea level and changes in extreme weather events are all consequences of the changing climate.

Figure 1: Examples of physical and ecological impacts of the changing climate in Canada





To build economic resilience to future climate realities, businesses and industry sectors need to adapt

Adapting involves adjusting to the consequences of changing climate conditions by managing risk and exploiting opportunities. Organizations can informally react to changes as they occur or they can bring coherence to adaptation implementation and priority-setting by being proactive, examining current risks, looking to the future and tailoring strategy accordingly.

What does a strategic approach to climate adaptation look like? Adapting to a changing climate is typically an ongoing process, not a one-off. It involves refining your understanding of the problem and potential solutions by cycling through phases of awareness-building, planning, implementation and iterative learning (Figure 2).

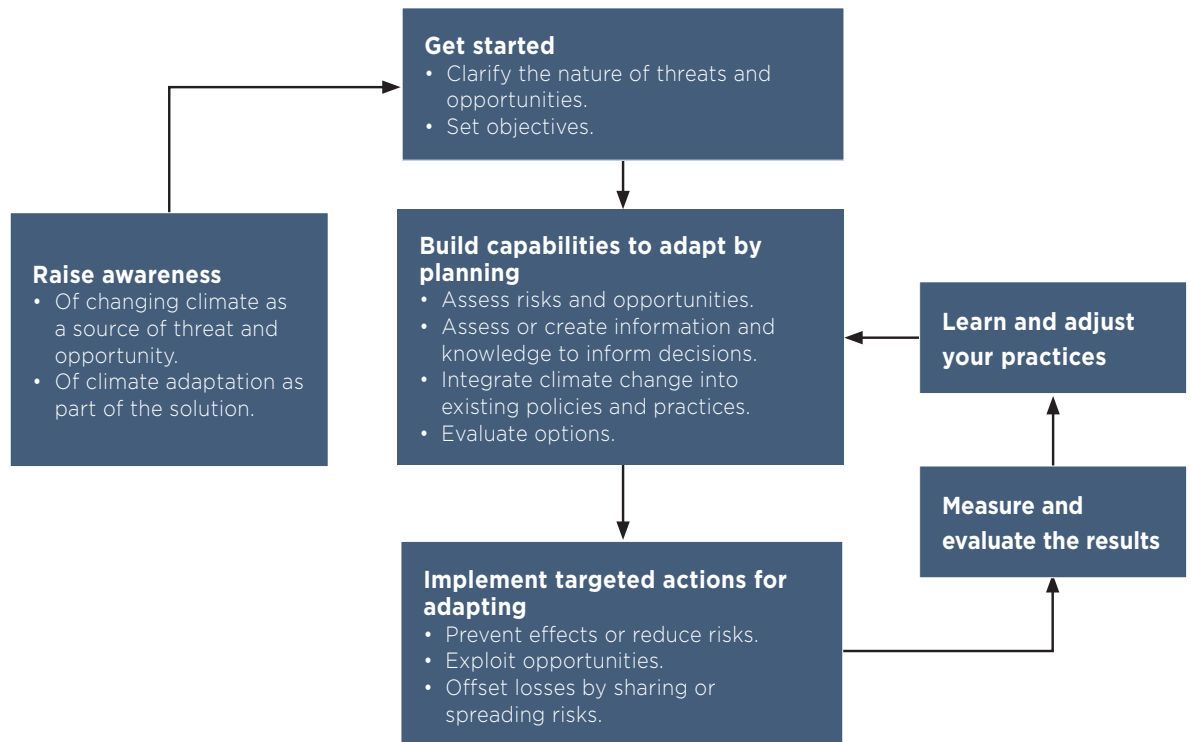
The focus and form of strategies for adapting will differ by organization, even within the same sector. A tailored approach is necessary because the

impacts of climate change vary by place and interact in complex ways with other drivers of change.

The following are examples of adaptation strategies used by businesses and industry.

Mining and Energy: To minimize supply chain disruptions, Rio Tinto Alcan, one of the world's largest manufacturers of aluminum, is developing a framework to identify the company's sensitivity to a range of climate change risks.³ These risks include varied hydropower-generation capacities, downtime of essential operations due to extreme weather events and the vulnerability of transport networks and regional populations. To address changes in hydro power, the company has formed a research alliance with the Ouranos consortium, so that reservoir management policies and practices can benefit from detailed climate change and streamflow scenarios.

Figure 2: Climate adaptation process



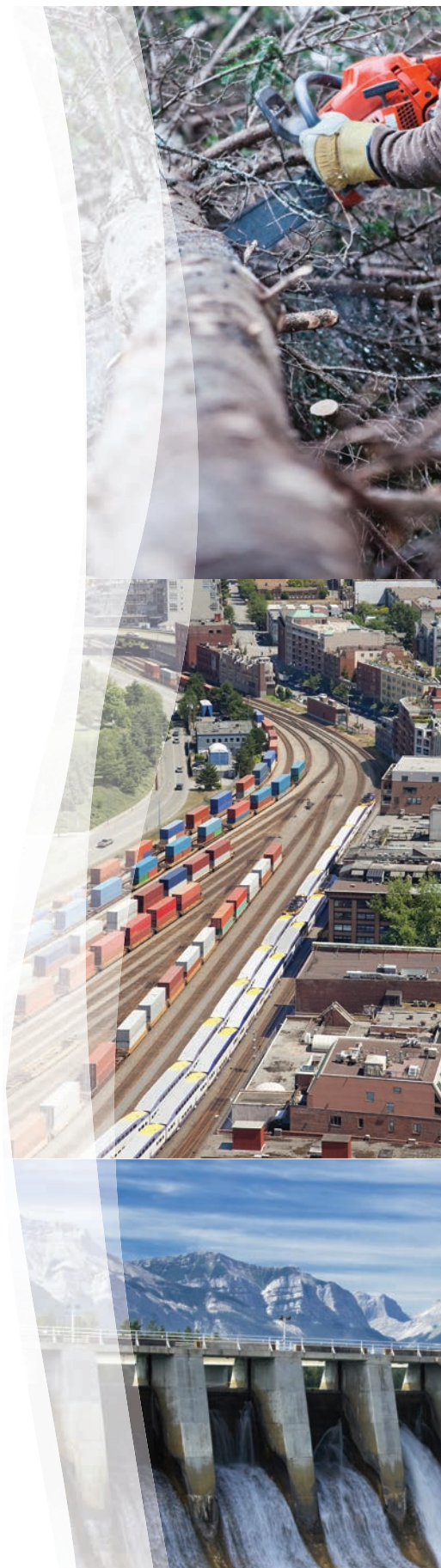
Tourism and recreation: To understand and limit climate change risk, the Whistler Blackcomb ski resort developed a “seven-step strategic framework.” Results of the first step – a risk assessment – informed the portfolio of climate adaptation actions the resort is taking to reduce losses from warming weather. Actions include doubling snow-making capacity, optimizing snow cover and diversifying business to include more off-peak activities.

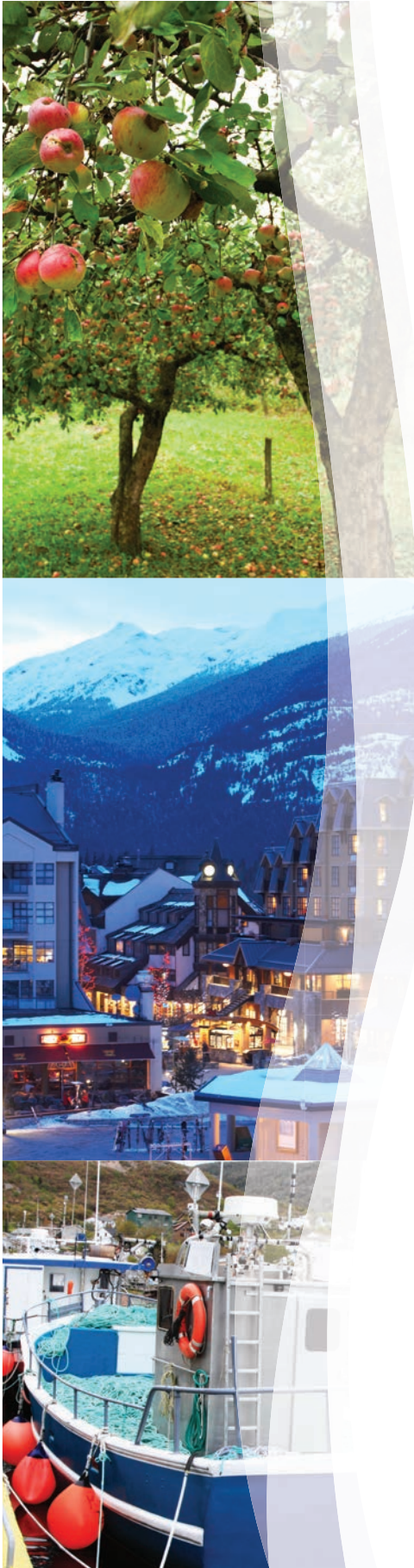
Agribusiness: Faced with possible incursions of bluetongue disease, an insect-borne disease of ruminants, in the future and resulting losses in market access, the Canadian Sheep Federation has established a voluntary insurance program for sheep farmers.⁴ Bluetongue is a viral disease carried by midges that is sometimes fatal to sheep. The range of midges capable of carrying the disease is currently limited to British Columbia, but could expand in a changing climate. With this program, insured sheep farmers receive compensation for loss of animals, business interruption and other market impacts if one of their animals contracts the disease.

Adaptation and mitigation

Responding to climate change requires a two-pronged approach. Reducing greenhouse gas emissions is *mitigation*. *Adaptation* involves adjusting activities and practices to decrease your vulnerability to negative impacts and to take advantage of potential opportunities. Mitigation is needed to reduce the magnitude and rate of climate change. However, additional impacts are unavoidable, even with aggressive cuts in global emissions, because of inertia in the climate system. Therefore, we also need to adapt.

Insurance: The Insurance Bureau of Canada has partnered with several communities to develop a tool that maps zones at risk of basement flooding and sewer backups. One use for the information generated is to help communities to assess the merits of infrastructure investments and insurers to improve the accuracy of insurance coverage and prices.⁵





Taking a proactive, planned approach to adaptation makes good business sense

Reacting to extreme weather or other changes as they occur can leave businesses vulnerable. By taking a proactive approach to adaptation, businesses can have the following successes.

Seize market opportunities: Not all impacts of a changing climate are bad news for business. For example, Canadian and global climate adaptation efforts represent commercial opportunities. One example is innovations in financial products and services to manage climate change risk. Another example is new devices that help doctors and veterinarians diagnose unexpected and emerging diseases transmitted by animals. However, exploiting potential opportunities takes vision and planning. Capturing economic gains from marine shipping through the Northwest Passage means tackling impediments to its use, which include insurance costs, reduced shipping speeds and a lack of supporting infrastructure.

Thrive in increasingly unpredictable and extreme weather: Agricultural producers are, by nature, weather-risk managers, but it is the ability to anticipate seasonal weather two years or more ahead that allows the industry to profit from crop choices, management practices and investments in irrigation infrastructure. Not only does a changing climate make predictions of seasonal weather that much more difficult, it also means that conditions and events considered extreme today will become more common in the future. The unprecedented heat wave in Ontario in March 2012, which caused fruit trees to blossom much earlier than

usual, followed by frosts in April, is a costly example of the need to prepare for the unexpected.

Avoid stranded assets: Making major retrofits to existing infrastructure based on climate change risk is a tough sell. However, integrating climate adaptation measures into asset renewal and replacement cycles increases the cost-effectiveness of infrastructure design, operation and maintenance decisions.⁶

Meet expectations: As the effects of climate change intensify, governments, investors and the public will ask questions about industry's understanding of climate change risks, opportunities and adaptation actions.⁷ Legal requirements, such as environmental assessments for major development projects and disclosure of material risks by publicly traded companies, could become key vehicles to promote and scrutinize management of climate change risks.⁸

Ensure long-term success: Long-term growth and success for the Canadian agribusiness and commercial fisheries depend on their ability to adapt. They need to adapt in an ongoing manner to climate change-related shifts in water availability and quality, the length of the growing season, and extreme weather events.⁹ Natural resource managers face the prospect of intervening to accelerate commercial tree species' natural response to shifting climate conditions. This and other practices will be needed to maintain the competitiveness and sustainability of Canada's forest industry in a changing climate.¹⁰

Businesses can get ahead by taking advantage of the information resources and collaborative platforms available to support adaptation

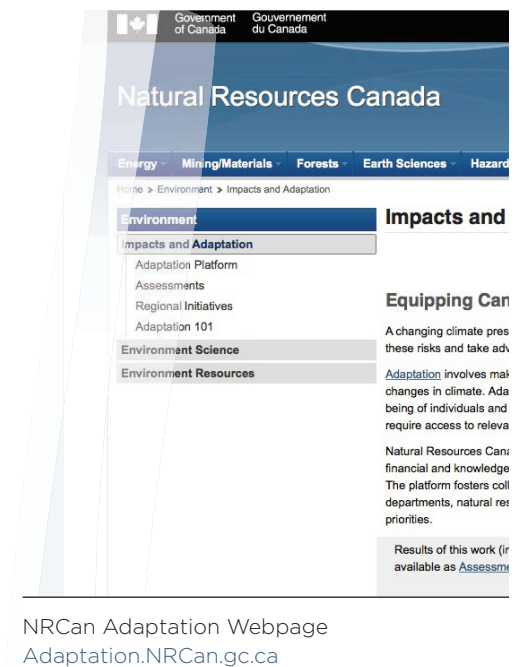
Strategies and tactics to prepare for current and future climate realities should incorporate the best available science and knowledge. Collaboration within industry sectors and with governments and research organizations can help businesses gain access to the data, information and tools needed to get ready. The following are key resources for business.

Climate data and projections: Since 2008, progress has been made in improving the quality, availability and accessibility of data from climate scenarios. Environment Canada's Canadian Climate Data and Scenarios website (ccds-dscc.ec.gc.ca) and regional groups such as the Pacific Climate Impacts Consortium (pacificclimate.org) and Ouranos (ouranos.ca) generate data, maps and graphs of future climate conditions, based on user needs.

Impacts and adaptation information and tools: Several programs deliver information on climate change impacts and options for adaptation in Canada. Program activities include clearly communicating science for decision-making, funding applied research projects and developing adaptation planning tools. Visit the following sites for more information:

- Natural Resources Canada: adaptation.nrcan.gc.ca
- PIEVC: pievc.ca
- Adaptation Library: adaptationlibrary.com
- Ouranos: ouranos.ca (Quebec)
- Atlantic Canada Adaptation Solutions: atlanticadaptation.ca
- Ontario Centre for Climate Impacts and Adaptation Research (OCCAR): climateontario.ca
- Prairies Regional Adaptation Collaborative: parc.ca
- BC Regional Adaptation Collaborative Program: fraserbasin.bc.ca/ccaq_bcrac.html
- Pan-Territorial Adaptation Partnership (PTAP): northernadaptation.ca/

Collaborative platforms: Collaborative platforms bring people together to ask questions, generate ideas and information, share knowledge and communicate with others. The National Climate Change Adaptation Community of Practice (CCACoP) is an online portal that enables information and knowledge sharing among researchers, experts, policy-makers and practitioners (ccadaptation.ca). The Adaptation Platform, led by Natural Resources Canada, brings together governments and professional organizations, along with industry associations and financial sector representatives, to address shared adaptation priorities (nrcan.gc.ca/environment/impacts-adaptation/adaptation-platform/10027).



NRCan Adaptation Webpage
Adaptation.NRCan.gc.ca



Adaptation Library
adaptationlibrary.com



Adaptation CoP
ccadaptation.ca



Endnotes

- 1 F.J. Warren and D.S. Lemmen, eds., (2014): *Canada in a Changing Climate: Sector Perspectives on Impacts and Adaptation*; 2014, Chapter 2: An Overview of Canada's Changing Climate, Chapter 4: Food Production, Chapter 6: Biodiversity and Protected Areas, Government of Canada, Ottawa, ON.
- 2 CDP [Carbon Disclosure Project] (2013). *CDP Canada 200 Climate Change Report 2013*. <https://www.cdp.net/CDPResults/CDP-Canada-200-Climate-Change-Report-2013.pdf>
- 3 Warren and Lemmen, *Changing Climate*, Chapter 3: Natural Resources.
- 4 Warren and Lemmen, *Changing Climate*, Chapter 4: Food Production.
- 5 Warren and Lemmen, *Changing Climate*, Chapter 5: Industry.
- 6 Warren and Lemmen, *Changing Climate*, Chapter 8: Water and Transportation Infrastructure, Chapter 9: Adaptation: Linking Research and Practice.
- 7 Warren, F.J. and Lemmen, D.S. (2014): Synthesis: in *Canada in a Changing Climate: Sector Perspectives on Impacts and Adaptation*
- 8 Warren and Lemmen, *Changing Climate*, Chapter 3: Natural Resources, Chapter 5: Industry.
- 9 Warren and Lemmen, *Changing Climate*, Chapter 4: Food Production.
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