



CHANGING CURRENTS

WATER SUSTAINABILITY AND THE FUTURE OF CANADA'S NATURAL RESOURCE SECTORS



National Round Table
on the Environment
and the Economy

Table ronde nationale
sur l'environnement
et l'économie

Canada



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I. NRTEE WATER PROGRAM

Two Questions

1. *With the development of the natural resource sectors on the rise, does Canada have enough water to support economic growth while maintaining the health of our country's ecosystems?*
2. *What do we need to do to sustainably manage our water resources for future generations?*

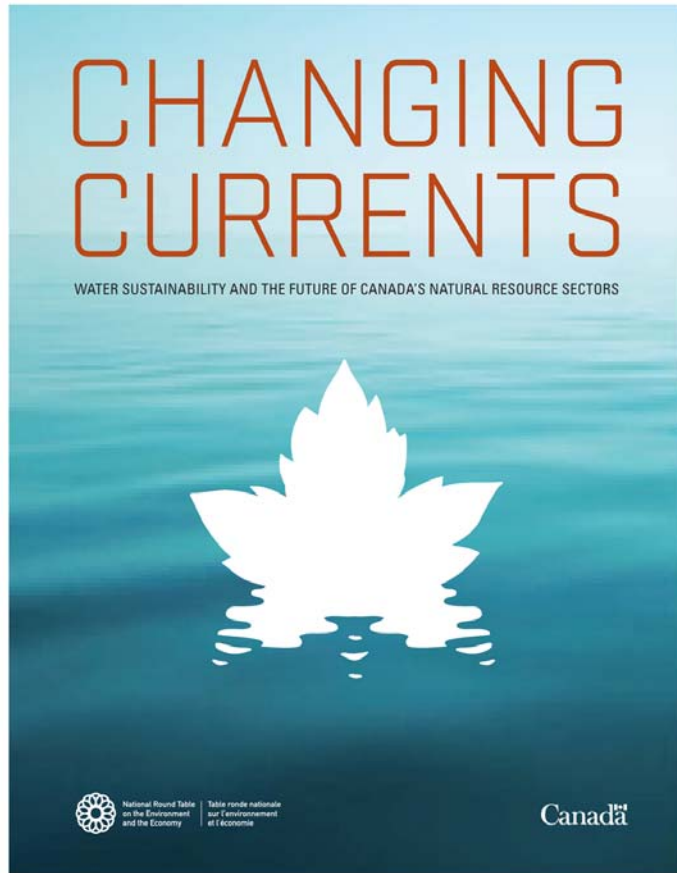
Two Phases

- Phase I (2009/10): Issue Identification – **Changing Currents**
- Phase II (2010/11): Options & Solutions – summer 2011





WHAT'S IN THE REPORT



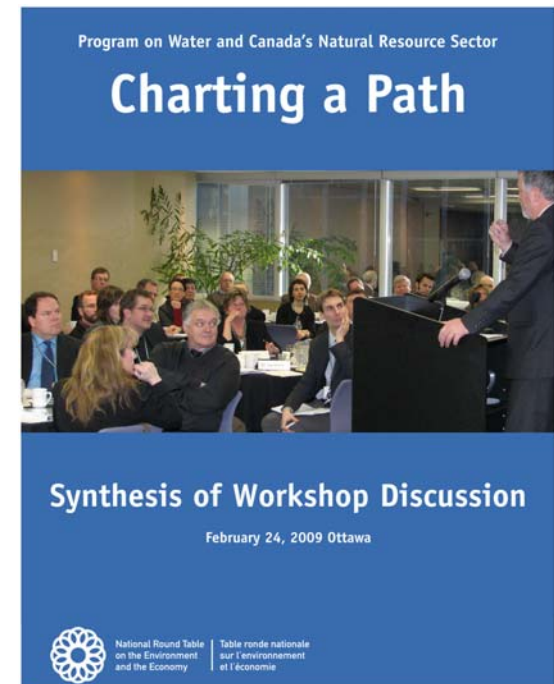
- **Addressing Nature's Water Needs**
- **Water Governance & Management in Canada**
- **Natural Resources Sectors – Water Use, Issues & Opportunities**
- **National Water Issues**





NRTEE PROCESS

- NRTEE Expert Advisory Committee of Canada's leading water experts
- Expert Workshop in February 2009
 - Scope out the NRTEE water program
- Partnered with key industry associations to host series of sector meetings:
 - Mining Association of Canada
 - Forest Products Association of Canada
 - Canadian Nuclear Association
 - Canadian Association of Petroleum Producers
 - Canadian Federation of Agriculture
- Water governance workshop in February 2010
 - In collaboration with Water Policy and Governance Group
- Resulted in Phase I Report – **CHANGING CURRENTS**

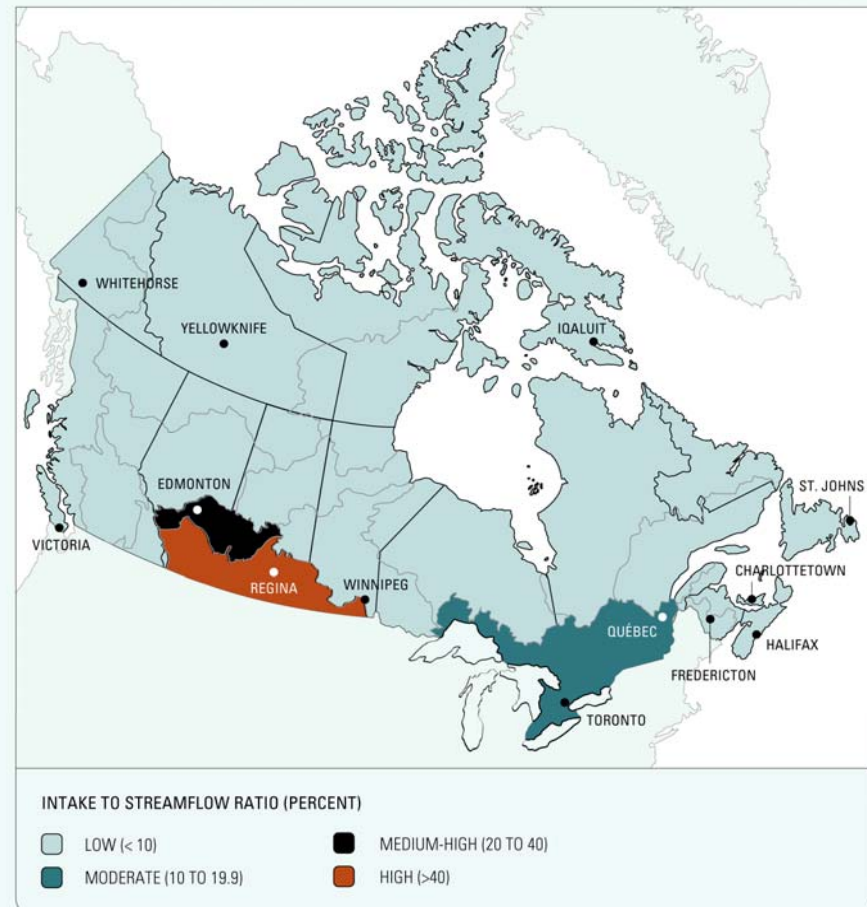




SETTING THE SCENE

- Misperception that Canada has an abundance of water
- Stresses on water resources already exist in some regions
- Economic growth & increasing demands for Canada's natural resources will mean more water will be needed
- Changes due to climate change will create uncertainty concerning temperature changes, rainfall, droughts and floods

WATER USE AND AVAILABLE STREAMFLOW IN CANADA



Source: Statistics Canada, Environment Accounts and Statistics Division, 2009.⁸



WHY FOCUS ON NATURAL RESOURCE SECTORS?

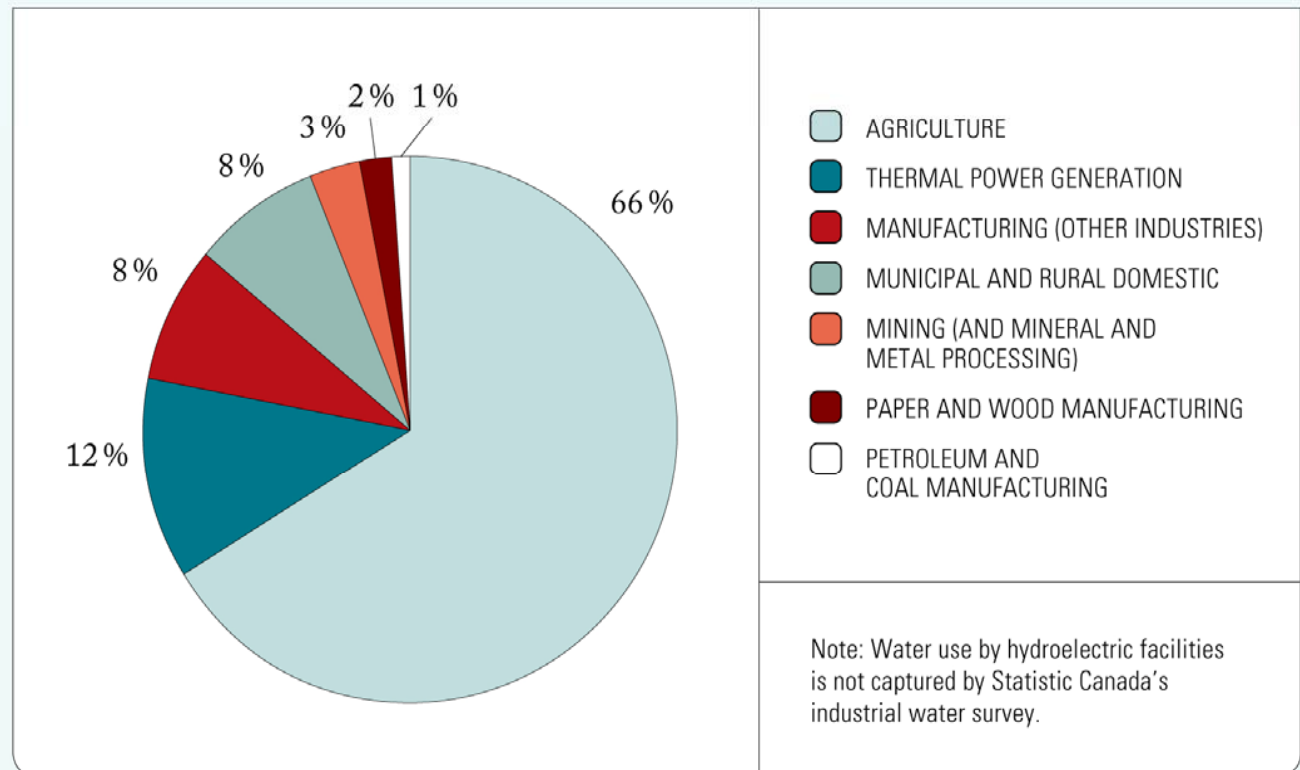
Economic importance:

- 12.5% GDP
- 50% - 65% economic growth anticipated by 2030

Most significant water users:

- 84% gross water use *and* water consumption
- Sectors' growth likely to result in significant increase of water use

CONSUMPTIVE WATER USE BY MAJOR CANADIAN SECTORS, 2005*





II. NATURAL RESOURCES SECTORS & WATER USE

FOCUS ON:

- Energy – electricity (hydro & thermal); oil & gas
- Forest – pulp & paper
- Mining – metals & minerals
- Agriculture

Identified:

- Key water uses
- Key water issues
- Challenges, opportunities





ELECTRICITY SECTOR (Hydro & thermal)

HIGHLIGHTS

- The most significant gross water user in Canada – 64% of gross volumes and 10% of consumptive volume
- For fossil and nuclear power generation, water availability is a key consideration when making decisions about the future electricity mix in Canada

- **Key Issues**

- Managing impacts of climate change and future electricity generation mix
- Managing impacts on ecosystems
- Water availability
- Impacts on water quality





OIL & GAS SECTOR

HIGHLIGHTS

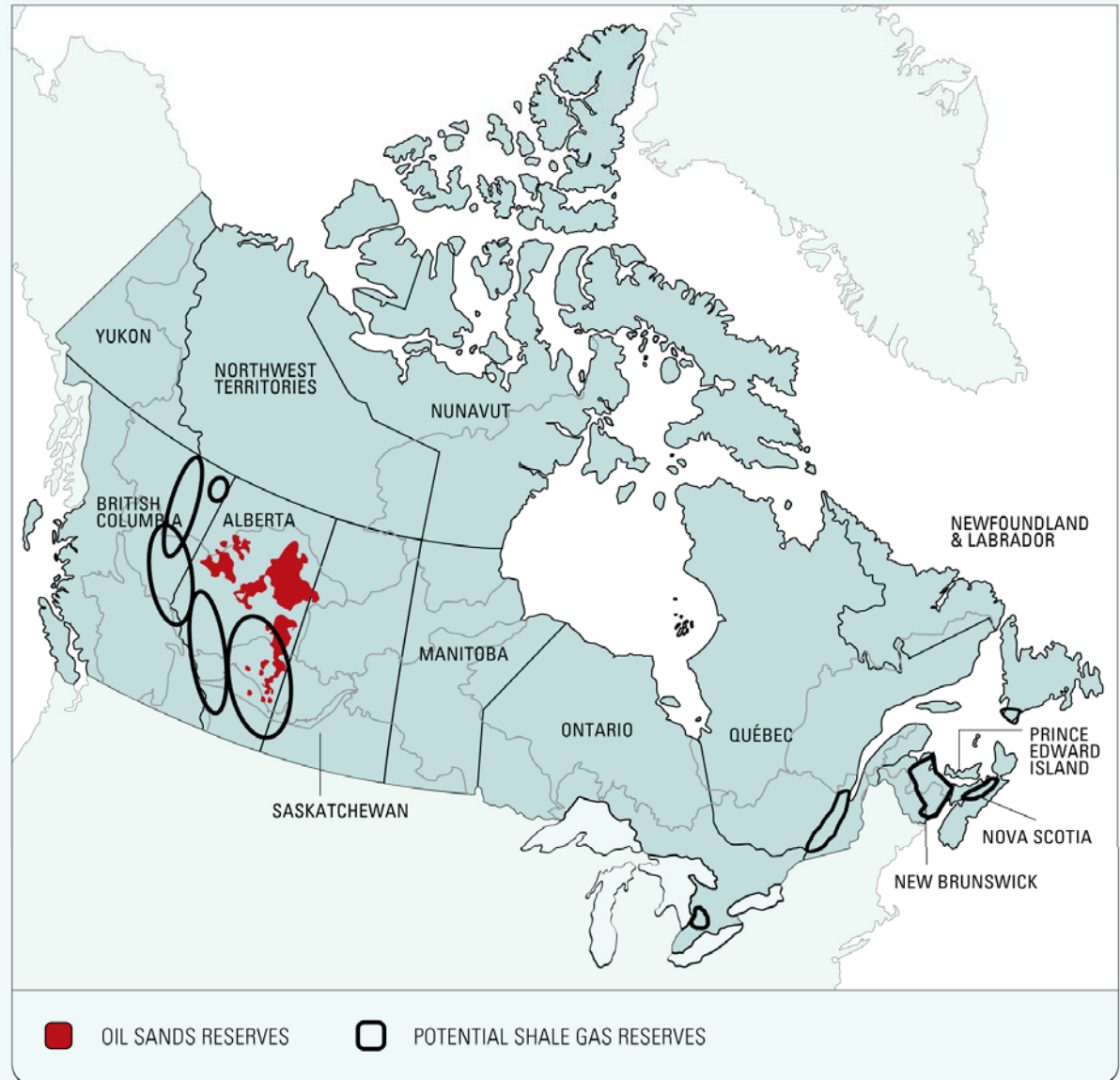
- Relatively small water user
 - 75% of Canadian oil & gas production in Alberta, with 7% of Alberta's total water allocations
- But strong sector growth will have regional water impacts
 - Oil sands production forecast to increase by at least 50% by 2013
- Impacts on water quality and ecosystems will continue to be a challenge
- **Key issues**
 - Water quality
 - Water availability
 - Unknown impacts on groundwater resources





Shale gas: An opportunity for sustainable development?

OIL SANDS RESERVES AND PROSPECTIVE SHALE GAS



Sources: Canadian Centre for Energy, 2009⁵¹; CSUG, 2010.⁵²



FOREST SECTOR

HIGHLIGHTS

- Not the most significant water user but water availability key to production
 - Pulp & paper uses 5% of Canada's gross water use, but with nearly 90% returned to surface waters after treatment
- Canada's forests play a crucial role in influencing quality and quantities of water resources
- **Key issues**
 - Limited knowledge of forest-water interactions
 - Public licence to operate
 - Pulp & paper mill effects on water quality and ecosystems





MINING SECTOR

HIGHLIGHTS

- Not a significant user or consumer of water
 - 3% of national consumption but...
 - Mining activities can have impacts on ecosystems and water quality if not managed properly
- Climate change impacts are important for management & future design of mines, particularly in the North
- **Key issues**
 - Water management and quality
 - Climate change adaptation





AGRICULTURE

HIGHLIGHTS

- Agriculture consumes more water than any other sector in Canada:
 - 66% of national water consumption
 - 77% of the sector's water use is for irrigation
- Regional impacts important – Prairies, Okanagan, Southwestern Ontario
- Anticipated increase in demand for irrigation, meat, crops and biofuels, are all likely to result in increased water demand
- **Key issues**
 - Climate change adaptation
 - Impacts on water quality & ecosystems





III. NATIONAL WATER ISSUES

1. Impacts of climate change on water resources

- Large-scale hydrological cycles driven by climate change are occurring and are anticipated to continue to change in the future
- Significant uncertainty related to hydrological events, and their subsequent impacts, is the main challenge





NATIONAL WATER ISSUES

2. Water-energy nexus

- Cost savings gained through energy conservation and efficiency is a key driver for improving water use for all of the sectors
- With the linkage of climate change mitigation and energy, the indirect linkage with water needs to be considered more in policy discussions





NATIONAL WATER ISSUES

3. Public licence to operate

- Increasing expectations from the public, as well as financial institutions, are a key consideration and driver of sustainable water management
- Good governance can enhance the “public licence to operate”





NATIONAL WATER ISSUES

4. Water governance and management

- Complexity of statutes and policies
- Outdated water allocations systems
- Limited policy instruments
- Limited knowledge base





IV. NRTEE Water Program Phase II

Water governance & management is key to sustainability

- **Water allocation approaches warrant further examination**
 - Are current water allocation approaches adequate?
- **Policy instruments for water management**
 - What opportunities exist to enhance water management using a broader suite of policy instruments?
- **Collaborative governance**
 - Can innovative collaborative governance help sustainable water management?
- **Water use data and information**
 - What information is needed to better understand and manage our water resources into the future?





CHANGING CURRENTS

WATER SUSTAINABILITY AND THE FUTURE OF
CANADA'S NATURAL RESOURCE SECTORS



The Report



Findings, Conclusions
and Next Steps



Natural Resource
Sectors



Interactive



Our Process



[Changing Currents: Water Sustainability and the Future of Canada's Natural Resource Sectors](#)

The world's supply of freshwater is limited and finite. While Canada is blessed with an abundance of freshwater, an expected increase in the development of the natural resource sectors begs the question of whether our country has enough to support economic growth while also maintaining the health of our ecosystems. We need to know whether we are in a position to sustainably manage our water resources for future generations and if we have the capability to deal with issues like an anticipated change in precipitation patterns caused by climate change.

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» [HTML version](#)



NRTEE WATER QUIZ

Test your knowledge of water and Canada's natural resource sectors.

Water is essential for the operation and growth of Canada's natural resource sectors. And as world-wide demand for our country's bounty of minerals, forest products, agricultural goods and energy continues to grow, so will the need for water.

START QUIZ

Water and Canada's Natural Resource Sectors (Interactive Map)

