

FLOW MONITOR

CANADIAN WATER POLICY WATCH

VOLUME 2 - WINTER 2010



Message from the Co-Chairs

We are pleased to bring you the second edition of the FLOW Monitor. The first article examines the Canadian Council of Ministers of the Environment's new Canada-wide Vision for Water, and why FLOW thinks this is a positive step forward. Subsequent articles review the:

- numerous parliamentary commitments to implement a national water strategy;
- impacts of climate change on Canada's water resources;
- process for defining environmental flows in the Athabasca River; and
- Rosenberg Forum's recommendations for the Northwest Territories' new water strategy;

It is our hope that as you read this issue, you will be encouraged by the depth of water policy dialogue occurring across Canada. FLOW will continue to work hard to ensure that these promises and discussions turn into decisive actions that will sustain fresh water resources for all Canadians.

Yours for improving Canada's actions on water,
Norm Brandson and Bob Sandford

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To learn more about actions FLOW believes the Federal government should take to address topics covered in each article, this icon directs readers to relevant sections in *Changing the Flow* at www.flowcanada.org.

BUBBLING TO THE SURFACE

CCME sets strategic directions for water

By Norm Brandson

On October 30th, 2009, the Canadian Council of Ministers of the Environment (CCME) released a framework to guide their future activities and actions in water. CCME Setting Strategic Directions for Water outlines a vision where “Canadians have access to clean, safe and

sufficient water to meet their needs in ways that also maintain the integrity of ecosystems.” The framework establishes CCME’s mission to facilitate the integration of research and policy that “contributes to sustainable

management, protection, restoration and conservation of Canada’s water.” Five goals are identified as a way of fulfilling this mission:

1. Protecting aquatic ecosystems on a sustainable watershed basis;
2. Promoting conservation and wise use of water;
3. Improving the management of water quality and quantity;
4. Reducing climate change impacts through adaptive strategies; and
5. Developing and sharing knowledge about the state of Canada’s water.

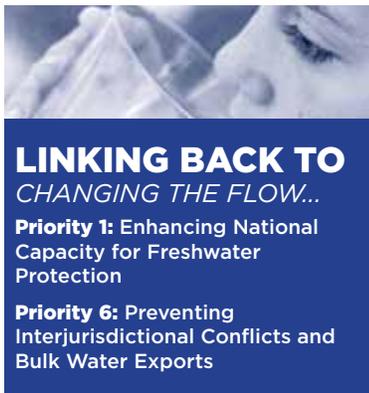
This vision is an admirable one and few could disagree with the broad goals, congruent with good stewardship. However, given CCME’s history (see page 4) and prior reluctance to tackle tough water issues, should we be optimistic about progress?

CCME’S RECORD ON WATER

CCME has been around, in one form or another, since 1961. To date, accomplishments related to water have been few and far between. In 1986, CCME developed water quality objectives that, although not standards, have gained wide if discretionary use in all jurisdictions. More recently, they developed a Canada-wide Strategy for the Management of Municipal Wastewater Effluent in February 2009, a positive sign that the council may be ready to take a more proactive approach toward water. However, generally speaking CCME has failed to reach consensus on an aggressive water agenda. Even when there was strong public opposition to bulk water exports in 2002, the council was unable to agree on a consensus position. As a result, inconsistent and easily voided interbasin transfer bans were legislated in the Provinces. Likewise, suggestions that all provinces adopt the Guidelines for Canadian Drinking Water Quality in legislation to ensure national consistency have born no fruit.

BARRIERS TO PROGRESS

Until now, water has not really had a governmental home. Canada does not have a ministerial water council, and for several reasons CCME has not yet filled this void. First, many provinces aggressively assert ownership of water within their boundaries. They have little appetite for a national consensus process where the 13 other jurisdictions could influence water management within their borders. Second, the management of water is fraught with jurisdictional fragmentation. Within most governments, no single ministry has responsibility for all aspects of water. This makes it challenging for a council of environment ministers to reach consensus when decisions frequently implicate ministries not at the table. Making matters worse, the federal government, with water responsibilities sprinkled over a dozen or so departments, has shown little leadership in the absence of consensus.



LINKING BACK TO CHANGING THE FLOW...

Priority 1: Enhancing National Capacity for Freshwater Protection

Priority 6: Preventing Interjurisdictional Conflicts and Bulk Water Exports

CCME'S STRENGTHS

Despite these barriers, CCME is a unique organization with a progressive governance structure. Many of CCME's features – equality of membership; a consensus decision-making process; the active participation of Québec; and historical success tackling tough issues like acid rain and federal-provincial harmonization of environmental assessment processes – make it the best bet among existing intergovernmental forums to assume the role of a water council.

HAS WATER FOUND A HOME?

There is general agreement within the water policy community that Canada's provinces and territories need to effectively operationalize a list of principles similar to those stated in CCME's five goals and that a national water policy is needed to confirm and articulate this direction. It remains to be seen whether CCME can overcome the obstacles that have prevented it from confronting tough water issues in the past. It is our hope that water – a previously orphaned resource amongst intergovernmental councils – has at last found a home with CCME. **F**

ORIGINS OF THE CANADIAN COUNCIL OF MINISTERS OF THE ENVIRONMENT

The history of CCME begins at the *Resources for Tomorrow* Conference in 1961, a landmark intergovernmental forum that resulted in a radical rethink of how Canada managed its renewable natural resources. Following the conference, the Canadian Council of Resource Ministers (CCRM) was established by eleven provincial and federal departments to bring a greater degree of collaboration to resource management. One of the most influential recommendations from CCRM was for each government to create a single agency or department responsible for environmental protection.

In the early 1970's, CCRM expanded to become the Canadian Council of Resource and Environment Ministers (CCREM); but then became the Canadian Council of Ministers of the Environment (CCME) in 1988 when environment ministers divorced themselves from their resource colleagues.

CCME is supported by an independent secretariat, a third of the budget for which is funded by the federal government, with the remainder provided by an annual levy on each jurisdiction proportional to population. The chair rotates each year and all members are considered equal participants in a consensual decision-making process. Importantly, Québec has been an active participant in CCME even when that Province was not participating in all other intergovernmental forums.

Canadian Council
of Resource
Ministers (CCRM)
CREATED IN 1961

Canadian Council
of Resource and
Environment
Ministers
(CCREM)
CREATED CIRCA 1970

Canadian Council
of Ministers of
the Environment
(CCME)
CREATED IN 1988

EMERGING CONSENSUS?

A Cresting Wave of Parliamentary Attention to a National Water Strategy

BY NANCY GOUCHER

According to the 2009 Canadian Water Attitudes Survey, the majority of Canadians identify freshwater as the country's most important resource. This is not surprising considering the importance of water to our economy, culture and environment – a message not lost on federal parties, as suggested by the commitments they have made to water over the past three years. Despite the divisive and hyper-partisan situation in parliament, this chronology suggests that the need for a national water strategy is one area where consensus is emerging across party lines. **E**



LINKING BACK TO

CHANGING THE FLOW...

Priority 1: Enhancing National Capacity for Freshwater Protection

Action 1: Facilitate the Development of a National Freshwater Strategy

MARCH 19, 2007 BUDGET

The current government committed \$35 million under their National Water Policy – \$30 million for cleaning up the Great Lakes, Lake Simcoe and Lake Winnipeg, and \$5 million for a Lake Superior study.

MARCH 22, 2007

In a news release, the Conservative Government committed \$93 million to “support a comprehensive National Water Strategy [to] ensure clean and safe water for Canadians.” They promised “action to improve the health and quality of Canada’s fresh water resources”.

OCTOBER 16, 2007

SPEECH FROM THE THRONE

“A new water strategy will be implemented to help clean up our major lakes and oceans and to improve access to safe drinking water for First Nations.”

PARTY PLATFORMS 2008

Conservative Party – They pledged to secure Canada’s strategic resources by reaffirming a ban on bulk water transfers and ensuring future energy development is clean and environmentally sustainable.

Liberal Party – committed to a National Water Strategy using regulations, monitoring, enforcement and new investment. The strategy would be informed and coordinated by a National Water Council and supported by a \$400 million Canada Water Fund.

NDP Party – would implement a National Water Strategy to improve water quality monitoring and enforcement of water quality standards. A comprehensive Water Quality Audit would ensure clean and safe water for all.

Green Party – their water platform was based on: “Keep it. Conserve it. Protect it.” They would keep the 1987 Federal Water Strategy; work towards conservation and the sustainable use of water; and use federal powers and inter-jurisdictional water sharing to protect freshwater ecosystems and ecological services.

NOVEMBER 26, 2009

In a speech at Laval University, Michael Ignatieff stated that a Liberal Government would implement a National Freshwater Strategy. “Our water is a national treasure. It’s also a national responsibility. We’ll start by cleaning up the waterway that stands at the centre of our country and our history – from the Great Lakes down the St. Lawrence. And we’ll begin the work of cleaning up Lake Winnipeg, one of the most important sources of freshwater in the West.”

MARCH 3, 2010 SPEECH FROM THE THRONE

“To further protect and preserve the diversity and health of our natural environment, our Government will bolster its Action Plan on Clean Water.”



2010 – A YEAR OF OPPORTUNITY FOR THE GREAT LAKES-ST. LAWRENCE RIVER ECOSYSTEM

The stars seem to have aligned in 2010, creating enormous potential to coordinate the management of the Great Lakes – St-Lawrence River ecosystem through the review or development of a number of major water governance initiatives in Canada, Ontario and Quebec this year.

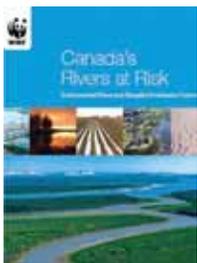
The most publicized of these initiatives is the renegotiation of the Great Lakes Water Quality Agreement (GLWQA), a binational agreement between Canada and the United States first signed in 1972. This landmark policy has been critical to public health and water quality improvements in the Great Lakes. The agreement is being revised to address today's more difficult challenges such as climate change, invasive species, and non-point source pollution.

In addition to the GLWQA, there are three other major water governance initiatives currently under consideration: the Canada-Ontario Agreement (COA) – a federal-provincial agreement that is the key mechanism for implementing the GLQWA – and the St-Lawrence Canada-Quebec Plan (SLP). This is the first time that COA and SLP have had identical review dates. The third is the Integrated St-Lawrence River Management Plan; a strategy that the Quebec government may finally begin eight years after the Quebec National Policy was released in 2002.

The review of these initiatives in 2010 presents an important opportunity for Canada, Ontario, Quebec and the United States to work together to create an integrated ecosystem-based approach that can effectively address current challenges and emerging threats to the Great Lakes – St-Lawrence River ecosystem.

COMUZZI APPOINTED TO INTERNATIONAL JOINT COMMISSION

FLOW congratulates the Honourable Joseph Comuzzi on his appointment as Canadian Chair to the International Joint Commission (IJC). We are encouraged by his appointment and his election by his fellow Commissioners as Canadian Chair. His knowledge of Canada-US relations and boundary water issues will serve both the Commission and Canada well. FLOW hopes to work with Comuzzi and the IJC to improve the sustainability of our boundary waters.



WWF-CANADA: CANADA'S RIVERS AT RISK

In October 2009, WWF-Canada released a report entitled, *Canada's Rivers at Risk: Environmental Flows and Canada's Freshwater Future*, exploring the health of ten of the nation's most important rivers.

The report assessed the cumulative impacts of three key threats to environmental flows in Canada's rivers: climate change, water withdrawals & diversions and flow regulation & fragmentation.

Findings suggest that flow regimes in some of Canada's most important rivers, such as the South Saskatchewan, Saint John and the St. Lawrence, have been modified to the extent that ecosystems are in serious trouble. Others – including some of the planet's increasingly scarce large, free-flowing rivers like the Skeena, the Athabasca, and the Mackenzie – are facing trouble as demands on their waters grow and climate change intensifies.

Download the report at www.wwf.ca/rivers.



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COPENHAGEN AND CANADA'S WATER

“Four hundred is the number of successive generations that have experienced broadly stable climate. Ours is the last.” – BBC FOCUS MAGAZINE

By Jim Bruce

It is through changes to hydrological systems – rivers, lakes, aquifers and wetlands – that impacts of climate change will be most seriously felt. Unfortunately, as reported in an LA Times article, *Copenhagen's missing ingredient: water*, all references to water were stricken from the draft text for the Copenhagen Conference of Parties Climate Change meeting in December 2009. Yet, if we look into recent changes in Canada's water resources, it is clear that the issue of climate change impacts is critical. Over the past 40 years, greenhouse gases have dominated changes in the global and regional climate. With no commitment to firm emission reduction targets in the Copenhagen Accord, the global community appears to have retreated back to where it was after signing the Framework Convention on Climate Change in Rio in 1992 – many good intentions but no agreed commitments.

Thus, there seems little doubt that rising global greenhouse gas emissions will be allowed to continue for several decades, with increased warming of the climate to mid-century and longer. For Canada's water resources, this means that four troubling trends observed in the last four decades will continue or accelerate to 2050 and likely beyond due to climate change.

LINKING BACK TO
CHANGING THE FLOW...

Priority 2: Responding to the Impacts of Climate Change and Energy Production



1. WORSENING POLLUTION

On the water pollution front, two consequences of climate change for water quality are of notable concern. The first is the increasing frequency of high intensity rain events, which erode croplands and transport nutrients and contaminants into waterways. Heavy rains also cause the overflow of storm sewers into city sanitary sewer systems, directly discharging waste into lakes and rivers.

The second is rising water temperatures in lakes and rivers. On the Great Lakes, ice cover has been declining since 1973, warming waters in winter with effects carrying over into summer. This not only increases evaporation but induces greater algal growth, and with longer stratification periods, contributes to oxygen depletion near the bottom. The health of the Lake Erie ecosystem is now backsliding and similar trends towards eutrophic conditions are evident in coastal regions of all the Great Lakes and in Lake Winnipeg. Higher water temperatures may also be reducing spawning and survival success of anadromous fish runs in the Fraser and other rivers.

2. FLOOD DAMAGE

Climate change has led to increased instances of flooding across seasons. Fall and winter storms are intensifying. Combined with sea level rise, these events are producing more devastating storm surges in coastal estuaries. In the spring and summer, intense rains have caused severe flash flooding across Canada – from Pangnirtung, Nunavut to Toronto to Vancouver Island. Basement flooding is increasing in cities across Canada when heavy rains overwhelm storm sewers. About two thirds of water-related health outbreaks come after heavy rain events, suggesting source water protection efforts for drinking water will need to be redoubled.

3. DROUGHTS AND DECLINING NATURAL FLOWS

Many Canadians will also witness declining local water levels in low-flow seasons. The retreat of glaciers and reduction of spring snowpack in the Rocky Mountains is causing declines in river flows and changes of seasonality. This is of particular concern in the already water-stressed areas of Canada, such as the Prairies and central British Columbia. Compared to future droughts, the 2000-2005 drought, which caused losses of \$5 billion, will be regarded as rather benign. Evidence suggests that droughts will be felt across the country as most of southern Canada's rivers, supporting the majority of our population, have shown declining trends in annual flows since 1970. Groundwater levels will also likely decline because of overuse during dry years.

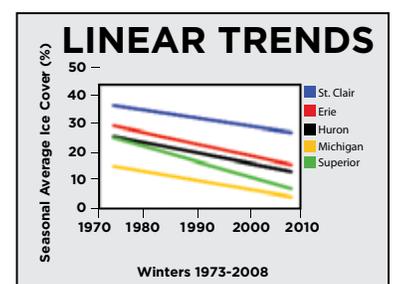
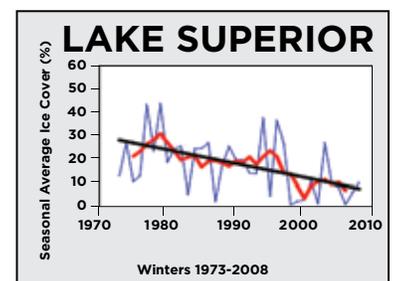
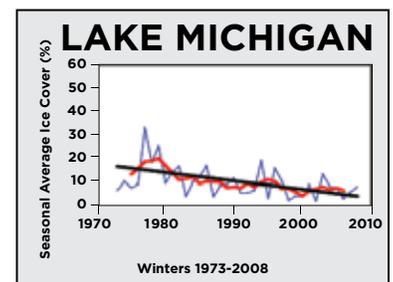
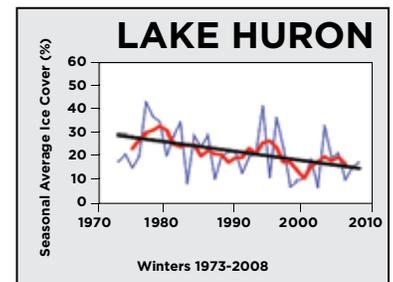
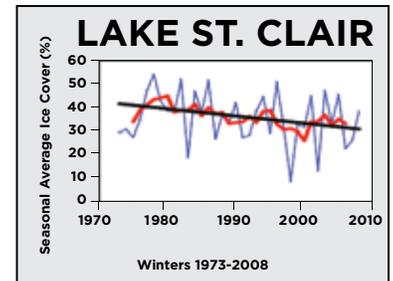
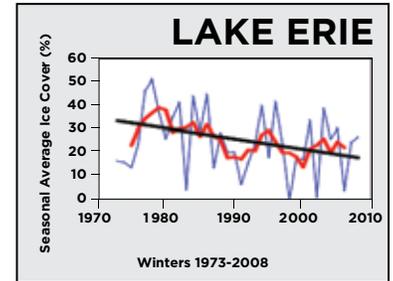
4. WETLANDS DETERIORATION

Aquatic ecosystems and wetlands are deteriorating or being forced to adjust to changing seasonal rhythms with ever earlier spring freshets, rising water temperatures, thawing permafrost and less ice. Reduction of ecosystem services will become increasingly widespread. Lastly, the melting and drying of more than one million square kilometres of peatlands will release large amounts of methane, a powerful greenhouse gas.

Some of the effects of climate change can be offset by generally costly adaptation measures, but there is a limit to the reduction of adverse impacts in large and complex water systems. Mitigation that includes global reduction of greenhouse gas emissions, is essential to protect our water resources. In our own self interest and for the protection of our most important natural resource, Canada needs to regain a leadership role in climate negotiations and work with other countries to establish firm global emission reduction commitments. There are substitutes for fossil fuels, but none for water. **E**

Source: Report to the International Joint Commission: Impacts on Upper Great Lakes Water Levels: St. Clair River (2009)

SEASONAL AVERAGE ICE COVER ON THE GREAT LAKES & LAKE ST. CLAIR



PROTECTING NATURE'S WATER NEEDS IN THE ATHABASCA RIVER

By Tony Maas

The Athabasca is one of Canada's most important and remarkable rivers. It provides the largest direct inflow of water to the Peace-Athabasca Delta – one of the world's largest freshwater deltas. Its waters are a primary input to the world's largest energy project – Alberta's oil sands.

The impacts of water taking by oil sands operators on river flows have been an issue for some time. Initially, the Cumulative Environmental Management Association (CEMA), a multi-stakeholder group created to manage the impacts of oil sands development, was tasked with developing a framework for protecting environmental flows (or instream flow needs) in the Lower Athabasca River. However, when CEMA failed to reach consensus by the 2005 deadline, Alberta Environment and the federal Department of Fisheries and Oceans (DFO) intervened and developed Phase 1 of a two-phase framework, released in March 2007.

Phase 1, currently in place, has been criticized for being unenforceable, for neglecting the impacts of climate change on river flows, and for failing to establish an ecosystem base flow (EBF) – a low flow threshold in the river below which no withdrawals are permitted in an effort to protect the ecosystem. The Phase 1 framework is an interim solution established to provide some protection of environmental flows while additional scientific studies and a more comprehensive decision-making process were undertaken to develop a Phase 2 framework.

In 2008, the Phase 2 Framework Committee (P2FC) was established to provide recommendations to Alberta Environment and DFO for the Phase 2 framework. The P2FC, comprising oil sands operators, environmental non-profits, one First Nation and one Métis group, and municipal, provincial and federal governments, was tasked to reach consensus on a framework to govern the timing and quantity of water withdrawals from the Lower Athabasca River by oil sands mining operations.

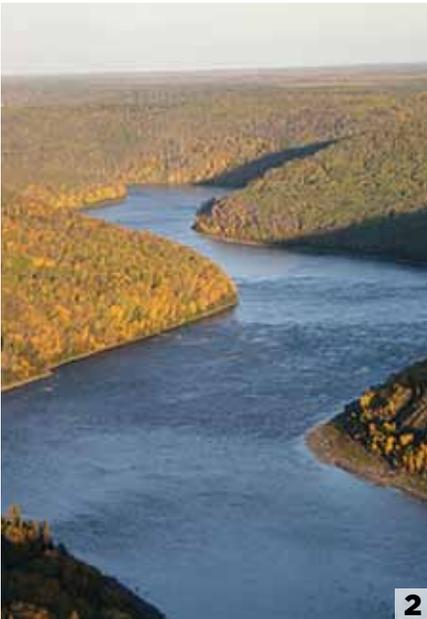
1. Athabasca Delta greenery near Wood Buffalo National Park. Photo David Dodge
 2. Athabasca River – south of Fort McMurray, Alberta Photo David Dodge
 3. Boreal forest along the Athabasca River. Photo David Dodge
- Photos courtesy of Pembina Institute – oilsandswatch.org

LINKING BACK TO CHANGING THE FLOW...

Priority 4: Protecting Aquatic Ecosystems and Aboriginal Water Rights

Action 7: Work with Alberta to implement water use targets in the oil sands

Action 13: Develop effective frameworks to mainstream instream flow needs



After almost two years of deliberations and dialogue, studies and sub-committees, the P2FC was unable to reach consensus. As noted in the 2010 committee report, there was agreement on a number of challenging topics including the need for legal implementation of the framework and the necessity of including climate change impacts in defining water withdrawal rules. While P2FC members reached agreement on the principle of an EBF (i.e., when river flows fall below a certain threshold withdrawals should be reduced to zero), some argued that implementation of the principle raises legal issues, in particular, conflicts with existing water rights held by industry. Responsibility for resolving such conflict was beyond the mandate of the P2FC. Addressing legal issues regarding water rights rest with the Government of Alberta and licensees.

The P2FC process tackled one of the most contentious water issues, and one of the most scrutinized industrial projects in the country.

However, the decisions being made reflect water governance challenges across the country as water demands grow, climate change impacts worsen, and the imperative to protect nature's water needs grows. Most of the existing legal and institutional frameworks appear unable to resolve differing perspectives on, and interests in, fresh water resources and ecosystems. As we go forward, can these frameworks be strengthened so as to better restore and protect the health of freshwater ecosystems, while also providing water to sustain livelihoods and economic development? Addressing such challenges demands a broader social debate on the value and importance of fresh water to the Canadian economy, culture and environment. This discussion is one that needs to happen as the P2FC's report is brought to the public for input in the coming months. The question will be whether the process provides adequate opportunity for a diverse array of interests to consider the necessary changes to public policy. Information on the Athabasca Water Management Framework is available from Alberta Environment at: www.environment.alberta.ca/1546.html. **F**

“The concept of environmental flows challenges us to look at water use from ecosystem outward – to answer the question of how much water we can use by first asking how much water the river can give.” –

CANADA'S RIVERS AT RISK –
WWF CANADA



TOWARDS A MODERN WATER ACT IN BRITISH COLUMBIA

By **Oliver M. Brandes** and **Linda Nowlan**

British Columbia's *Water Act* is over 100 years old, out of date and no longer able to address existing and emerging water issues in the province. To help ensure a prosperous future, the BC government has committed to modernize its *Water Act* with the goals of 1) building capacity for water conservation and stewardship; and 2) legally protecting environmental flows and watershed health.

The timing is no coincidence – people are increasingly recognizing that the impacts of climate change will be experienced through water as we face longer and drier summers, diminished watershed health and function, and reduced storage capacity in our glaciers, aquifers and snowpack. Conflict, drought and water scarcity loom, even for a relatively wet place like BC.

The Premier of British Columbia asked citizens to become part of the solution for securing their water future. In response, a group of NGOs led by Watershed Watch Salmon Society, EcoJustice and the POLIS Water Sustainability Project, and endorsed by at least 29 groups, submitted a detailed *Statement of Expectations*, organized around four priorities:

1. Protect stream health and aquatic environments
2. Improve water governance arrangements
3. Modernize the water allocation system
4. Regulate groundwater use

The implications of this effort are significant for the rest of Canada as the new Act could be the first to define the path towards a more sustainable approach to water management and governance.

For a copy of the Statement visit:
<http://poliswaterproject.org/news/308>.

NORTHERN LIGHTS:

ROSENBERG FORUM ENDORSES VISIONARY NORTHWEST TERRITORIES WATER STRATEGY



LINKING BACK TO CHANGING THE FLOW...

Priority 6: Preventing Interjurisdictional Conflicts and Bulk Water Exports

By Robert Sandford

The renowned Rosenberg International Forum on Water Policy was invited in 2009 to offer advice to the Government of the Northwest Territories on three matters: 1) review the draft plan, *Northern Voices, Northern Waters: Towards a Water Resources*

Management Strategy for the Northwest Territories, recommend how to improve it and to identify potential barriers to its implementation; 2) assess the appropriateness and effectiveness of water resource management decision-making tools proposed for the government's use; and 3) examine natural capital accounting approaches that have been developed for the Mackenzie River Basin, recommend ways to improve assessments of the environmental assets of the Northwest Territories, and recommend methods for strengthening public support for the water strategy through improved understanding of the value of the region's water resources.

As the proceedings in Yellowknife unfolded, it became increasingly apparent that the water resources in the Northwest Territories are of a global importance – the lands and waters of the Mackenzie basin not only form the cultural and economic foundation of local inhabitants, they perform eco-hydrological functions that benefit the entire continent.

The Rosenberg Forum held that the Mackenzie River Basin may be one of the lynch-pins holding North America's water-ice-climate interface

together. If its stability is compromised, it could cause the Earth's climate to wobble further out of its current equilibrium, with implications for all the ecosystems on the continent whose stability is coupled to current climate variability.

The Forum recommended that primary studies to establish economic and ecosystem values must be combined with ongoing research specific to the region so that values arrived at are not simply extrapolations from elsewhere, but accurately reflect the value of these ecosystems locally and to the rest of the world.

The Forum noted the importance for the NWT to recognize upstream jurisdictions – British Columbia, Alberta, Saskatchewan and the Yukon – as partners in the joint-management of mutually important resources. A need was identified, also, to validate new language with respect to cultural values, and to teach that language to the NWT's riparian neighbours.

The panel further observed that ample legal precedent already exists to establish the NWT's water quality and ecosystem health interests in the context of upstream uses and impacts. However, there is strong evidence to suggest that existing federal regulations protecting upstream waters were not being enforced. Thus, the panel suggested that the NWT should be pressing hard, even to the point of threatening legal action, for enforcement of already existing federal laws regarding water quality threats posed by Alberta's oil sands.

Read the Rosenberg International Forum on Water Policy Report on the Northwest Territories Water Strategy at <http://rosenberg.ucanr.org/>. **F**

On September 23, 2009, the Munk Centre for International Studies at the University of Toronto hosted a conference on the subject of burying carbon dioxide in underground aquifers. The main conference paper was prepared and presented by Graham Thompson, award-winning journalist with the Edmonton Journal, who had been studying carbon capture and storage (CCS) while on a Canadian Journalism Foundation fellowship at the University of Toronto. His key conclusions are:

THE CHALLENGE OF SCALE: The Alberta government proposes to bury 140 million tonnes of CO₂ by 2050 and has invested \$2 billion of taxpayer's money in several demonstration projects. However, many CCS researchers such as David Keith doubt the veracity of such optimistic scenarios. By one estimate the United States would have to construct 300,000 injection wells at a cost

a threat to human health and ecosystems, could also pose a variety of largely unquantified risks to groundwater systems located above carbon storage basins throughout western North America. The rapid injection of CO₂ could force brine waters to migrate into the shallow portions of freshwater aquifers. Such a migration could affect pressure and degrade water quality. The U.S. Lawrence Berkeley Laboratory calculates that the corrosive properties of CO₂ combined with the long life of injection wells will make management of water issues an "intensive task." Groundwater acidified by CO₂ leaks may release a variety of heavy metals including arsenic and lead in nearby mineral surfaces leading to contamination of drinking water above health-based limits. They thus conclude that "the impact of large-scale CO₂ injection and related brine displacement on regional multilayered

CARBON CAPTURE AND STORAGE: POLITICAL FOLLY OR CLIMATE CHANGE FIX?

For more information on the Conference, please contact Adele Hurley, Director of the Program on Water Issues at the Munk Centre for International Studies, University of Toronto (hurleyut@istar.ca). The full text of the Conference Paper and a webcast of the conference can be found on the Program on Water Issues website (www.powi.ca).

of \$3 trillion by 2030 just to keep emissions at 2005 levels. University of Manitoba energy expert Vaclav Smil has calculated that governments would have to construct CO₂ infrastructure about twice the size of the world's crude oil industry just to bury 25% of the world's emissions. It is significant that Howard Herzog, a respected carbon capture research engineer at MIT, routinely laments that no large-scale power plant with CCS yet exists on the planet. "Is it reasonable to expect to build hundreds of power plants with CCS by 2050 when we are having so much trouble building just one today?" In sum, scaling up CO₂ deployment from megatonnes to gigatonnes remains a difficult challenge around the world.

LEAKAGE AND GROUNDWATER: Large-scale deployment of CCS will inevitably result in leaks over time into the air or groundwater. These leaks,

groundwater systems has not been systematically assessed."

THE BOTTOM LINE: Given the paucity of groundwater information in Canada and lack of national standards, the push to accelerate CCS could pose real risks to our groundwater resources. The marriage of a brave new technology with a political fix for an immediate climate problem could have negative long-term consequences for Canadian taxpayers and water drinkers without stabilizing the climate. To move forward on the sequestration of billions of tonnes of carbon dioxide in underground saline aquifers without strong regulation, clear liability, effective oversight, sound science and transparent decision-making process would be sheer folly.

FLOW MEMBERS

The Forum for Leadership on Water (FLOW) is an independent group of water experts from across Canada that encourages government action to protect and steward our critical freshwater resources. We are committed to proposing policy solutions, urging action and tracking progress towards a more sustainable water future.

We believe that all levels of government and broader civil society must work together as part of a Canada-wide strategy that effectively addresses current and emerging threats to freshwater security.

To sign up for future editions of the FLOW Monitor, visit our website www.flowcanada.org.

David R. Boyd, POLIS Project on Ecological Governance, University of Victoria

David is a leading environmental lawyer, a Trudeau Scholar and an adjunct professor at Simon Fraser University. He is a Senior Associate with the University of Victoria's POLIS Project on Ecological Governance.

Oliver M. Brandes, POLIS Project on Ecological Governance, University of Victoria

Oliver is the Associate Director and leads the Water Sustainability Project at the University of Victoria's POLIS Project on Ecological Governance. His research focuses on watershed governance and legal and institutional reforms for sustainable water management and he provides strategic policy and governance advice to all levels of government and non-government organizations.

www.poliswaterproject.org

Norm Brandson, Water and Resource Policy Consultant

Norm is a Professional Engineer and a practicing consultant on resource and environmental issues. He has been Deputy Minister of the Department of Environment and the founding Deputy Minister of the Departments of Conservation and Water Stewardship in Manitoba.

James P. Bruce, Soil & Water Conservation Society

Jim is Canadian Policy Representative for the Soil and Water Conservation Society and a consultant on climate change adaptation, water management and natural disaster mitigation. He has been Director of the Canada Centre for Inland Waters as well as the Assistant Deputy Minister for Environmental Management and Atmospheric Environment. www.swcs.org

Marc Hudon, Nature Québec

Marc is Director of the St. Lawrence River/ Great Lakes program at Nature Quebec and President of the Priority Intervention Zone Committee on the Saguenay river. He is also President of the Quebec Regional Advisory Council on Marine Oil Spills. www.naturequebec.org

Tony Maas, WWF-Canada

Tony is Freshwater Director with WWF-Canada. His work takes him across Canada and around the planet to engage business leaders, policy makers, politicians and citizens in freshwater stewardship and conservation. www.wwf.ca

Ralph Pentland, Canadian Water Issues Council and Ralbet Enterprises Inc.

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Merrell-Ann Phare, Centre for Indigenous Environmental Resources

Merrell-Ann Phare is Executive Director and Legal Counsel to the Centre for Indigenous Environmental Resources. She serves on numerous advisory committees and consultation bodies, including the Joint Public Advisory Commission of the NAFTA Commission for Environmental Cooperation. www.cier.ca

Robert Sandford, United Nations International "Water for Life" Decade

Bob Sandford is the Canadian Chair of the United Nations International Decade "Water for Life" Decade, a national partnership initiative that aims to advance long-term water quality and availability issues in response to climate change in this country and abroad. Bob is also the Director of the Western Watersheds Climate Research Collaborative.

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