



# tomorrow's forests

FALL 2008

## THE SFM NETWORK NEWSLETTER

Research excellence through training, networking,  
partnerships and knowledge exchange



## Update: State of Knowledge (SoK) Projects

Climate change, global competition in forest products, and biodiversity conservation are just a few of the many issues creating new challenges for SFM Network partners. Such issues demand new insights, options, and solutions – and call for new kinds of research questions that could yield valuable insights regarding additional options and solutions.

Now celebrating its 14th research year, the SFM Network is reflecting on the current State of Knowledge (SoK) regarding research topics of concern to SFM Network partners. After much discussion, the SFM Network Research Planning Committee (RPC) identified six critical research areas. As a result, six research teams were formed, each headed by a Principal Investigator (PI) (photos above L to R):

**Dr. Vic Adamowicz** (natural capital and ecosystem valuation);

**Dr. Irena Creed** (implications for water resources on the forested landbase);

**Dr. Mark Johnston** (forest vulnerability to climate change);

**Dr. Ellen Macdonald** (ecological implications for altering mixedwood forest composition);

**Dr. Yolanda Wiersma** (innovations regarding protected areas in SFM); and

**Dr. Stephen Wyatt** (reviewing the Canadian experience in harmonizing Aboriginal and industry interests).

“My direction to each PI was to capture the current state of knowledge, practice and policy for each topic, identify points of consensus and debate, identify critical knowledge gaps, and potential changes in practice,” stated SFM Network Scientific Director Dr. Jim Fyles. As well, each team is summarizing the published literature on each topic and is drawing on the expertise of practitioners from a wide range of disciplines.

This issue of *Tomorrow's Forests* provides an interim report regarding some of the key findings from each project team. Final results will be presented at the SFM Network's concluding national conference to be held in Gatineau, QC at the Hilton Lac-Leamy Hotel, April 21-23, 2009.

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# Valuing Nature: Market-Based Approaches to Forest Ecosystem Management

by Dr. Vic Adamowicz

Increasing environmental pressures have generated growing awareness in recent years of the challenges inherent in ensuring the provision of what are often termed “ecosystem goods and services”. Ecosystem goods and services are generally described as the range of benefits that people obtain from functioning ecosystems. These services may include the provision of food, water, timber, and fiber; regulation of climate, floods, and water quality; and provision of recreational and aesthetic benefits. In other words, ecosystem goods and services are the ecological benefits that are either directly valued by humans or used as inputs into production processes from which humans derive things of value.

Many ecosystem goods and services are typically left out of the marketplace because they are difficult to trade and price. Consequently, suppliers of ecosystem goods and services are often not rewarded for many of the benefits they provide to society. At the same time, individuals who use, and in effect reduce, ecosystem goods and services do not bear the full social cost of their actions. In economics, these unaccounted-for benefits or costs are referred to as unaccounted uses or “externalities”, and they lead to market failure. The result of this market failure is that, without appropriate regulatory institutions, individual agents tend to supply fewer ecosystem goods and services than what is considered socially optimal.

Dr. Adamowicz and his research team are reviewing how market-based policy instruments can be used to help ensure ecosystem goods and services are appropriately accounted for when implementing sustainable forest management practices. Such instruments are objective rather than prescriptive. They encompass a range of policy tools, from pollution taxes and tradable permits to direct payments for conservation efforts. The common element is a desire to change the behaviour of land users by altering the structure of incentives they might consider.

A number of challenges can inhibit the implementation of market-based instruments for environmental management. Nesting effective market-based policies within existing administrative, policy, and constitutional frameworks is one of the most difficult barriers to address. Measuring and monitoring the provision of ecosystem goods and services to ensure their delivery is also challenging. And policy makers must be able to identify in which circumstances market-based instruments are more appropriate than traditional regulatory approaches to environmental conservation.

The research being conducted by Dr. Adamowicz and his team uses a comprehensive survey of the literature, in combination with expert interviews in Canadian and foreign jurisdictions with experience in market-based policy implementation (such as Australia). This research will shed light on issues involved in the future use of market-based policies for sustainable forest management.

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2009 NATIONAL CONFERENCE

## ENVISIONING TOMORROW'S FORESTS

**Confirmed keynote speakers:**

**THOMAS HOMER-DIXON**  
Futurist in social adaptation to complex change

**C.S. (BUZZ) HOLLING**  
Conceptual father of adaptive management and ecological resilience

**Please plan now to join us!**

Save these dates  
**April 21-23, 2009**

[WWW.SFMNETWORK.CA](http://WWW.SFMNETWORK.CA)

Hilton Lac-Leamy Hotel  
Gatineau, Québec



# Conserving Water Resources in Canada's Changing Forest Landscape

by Dr. Irena Creed

Over 40% of Canada's land base is forested, providing resources and services for many communities, including a safe and sustainable supply of water. The continued sustainability of Canada's forests and associated water resources are at risk due to ever increasing demands for resources at a time when climate change is creating greater uncertainties about their future. These risks pose a challenge for decision makers, who need relevant science to inform their decisions.

Several scientists have predicted that water will be Canada's foremost ecological crisis early in this century. Global warming and the catastrophic events associated with climate change are expected to have implications for the water cycle, adversely affecting water quality and quantity, and increasing the risks to communities living in or near forests. There is an urgent need to understand the scientific, management, and policy links between forests and water resources.

Dr. Irena Creed and Ms. Margaret Donnelly are working with a nation-wide team of scientists and practitioners to assess the potential effects of forest management and disturbance on surface water and ground water resources. The project team is preparing a State of Knowledge (SoK) report based on scientific literature as well as discussions with researchers and practitioners on the conservation of water in forested landscapes under current and future climate change scenarios.

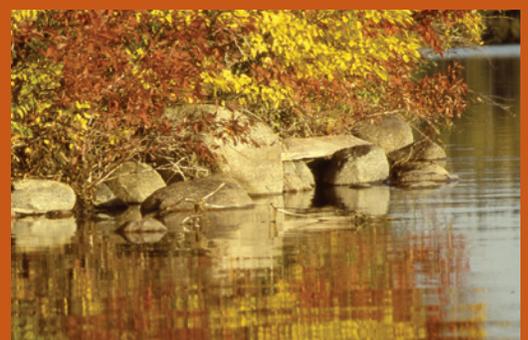
The SoK is synthesizing previous reviews on forest-water interactions and disturbance events. These reviews indicate that the nature of post-disturbance effects is not only dependent on site characteristics such as climate, geology, topography, and forest species, but also on the type, extent, location, and timing of disturbance events. The effects of climate change on these dynamics are largely unknown, but are expected to vary widely among regions.

The SoK is also reviewing the state of policy and practice to identify strengths and weaknesses of current forest management practices in terms of conservation of water resources. More specifically, the review examines: (a) the extent to which legal, institutional, and economic frameworks support forest management that promotes conservation of water resources; (b) the capacity to measure and monitor changes in water resources; and (c) the capacity to apply research and development aimed at improving forest management.

While forest planning in Canada does address water resources in many jurisdictions, the focus has historically been on single objectives at a local scale (primarily fish habitat) rather than a more integrated consideration of aquatic systems at multiple scales. There is a need to extend the spatial focus of planning and practices beyond stand and catchment scales. Landscape-scale interactions through space and time and the cumulative effects of all land uses must also be considered

The report is being organized around a set of hydrological principles that provide healthy, functioning aquatic systems and evaluate existing policy and practices used across Canada. These principles provide the basis of a management framework to ensure water resources are sustained for future generations. They also identify which components of the integrated water system will be most susceptible to climate change. Through the process of developing the SoK, the project team will identify future research needs and knowledge gaps as well as recommend changes to current policy and/or practice to enhance their effectiveness in conserving water resources.

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# Climate Change and Forest Management in Canada by Dr. Mark Johnston

Climate change is expected to affect forests in Canada to a greater degree than in other parts of the world. Recent research has indicated that forest disturbances like fire and insects may increase in frequency and severity, with associated impacts on not only harvestable wood supply but also wildlife habitat, recreational values, and First Nations' traditional uses. These impacts will be highly variable across the country. For example, there may be a threat of increased fires in central boreal regions and increased wind storms in Atlantic Canada.

Climate change may not be uniformly negative. While drought is likely on the southern margins of the boreal forest, other areas may experience an increase in tree growth on sites where other resources (e.g. water and nutrients) are not limiting. Tree species distributions are likely to shift over the long-term, as the location of favorable conditions change and species are unable to regenerate following disturbance. Operations in the forest, such as harvesting and hauling, will likely be affected by warmer winters and a shorter season of frozen ground.

Forest-based communities are likely to be affected by changes in species distributions, which will result in changes to wood supply to mills. Forest-based recreational opportunities will change due to changes in water availability, wildlife distributions, and snow cover. The ability of First Nations communities to carry out traditional activities (e.g. food gathering, medicinal plant collection, hunting and fishing) will change as the forest types and water bodies around them change.

Forest management will have to adapt to these changes. Utilization of new species and development of new forest products will be required. Carbon sequestration will likely become an important component of the values that forests are managed for, and may add a secondary source of revenue for the forest industry. Learning to manage for changing wood supply due to increased disturbances will be essential in some regions, particularly the central boreal forest.

Flexibility in harvest scheduling will become increasingly important as frozen ground conditions become less reliable and extreme events (e.g. heavy precipitation, flooding) prevent access to some areas. Forest management policy will need to become more flexible and encourage innovation as new approaches to forest management are identified and implemented. Forest management plans should be used to explore options for future forest management taking into account various climate change scenarios.

Canada has a high standard of forest management and a highly educated professional workforce. At the individual level, adaptive capacity is high. However, institutional and economic barriers may prevent adaptation options from being implemented. These barriers need to be identified and addressed to ensure the continued health and productivity of Canada's forest in a future of climate change.

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UPCOMING  
**FOREST FUTURES WORKSHOP**

This is your chance to weigh in with informed opinions on how forest policies should be directed to support forest and forest-sector sustainability through the next decade.

Edmonton, Alberta

WORKSHOP  
**DECEMBER 1, 2008**

For more information, contact Dr. Peter Duinker | [peter.duinker@dal.ca](mailto:peter.duinker@dal.ca)



# Unmixing the Mixedwoods: Biodiversity, productivity, and climate change issues in the boreal mixedwoods

by Dr. Ellen Macdonald

Over the last few decades, forest managers and research scientists have gradually come to understand and appreciate that the boreal forest is not just about conifer trees. Indeed, the southern edge of the boreal forest across Canada is a distinct biome characterised by a high proportion of mixed stands composed of both broadleaf and conifer trees. Researchers have demonstrated that this region is not only characterized by distinct stand dynamics, but also that it harbours distinct assemblages of species, be they birds, understory plants, or insects.

Managing forest stands and landscapes as mixedwoods within this region has proven challenging for a number of reasons. Although many research initiatives and operational trials have been undertaken in the boreal mixedwoods, the absence of an integrated understanding of the knowledge gained from these may be hindering the application of ecosystem management in the boreal mixedwood biome.

A group of research scientists from across Canada is currently synthesizing available research results in order to address the ecological implications of altering the composition of the boreal mixedwoods. Specifically, the research team is addressing the significance of a change in composition of mixedwood landscapes on biodiversity, tree productivity, and soil processes. The team's research also includes the study of regeneration standards and their effect on mixedwood composition and dynamics, with consideration of planning for future climate change. Results of this research will be presented during a series of e-lectures in conjunction with the Canadian Institute of Forestry.

## **Tree composition and biodiversity in boreal mixedwoods: different roofs, different inhabitants?**

**November 26, 2008**

This lecture will examine how the biodiversity of boreal mixedwoods is different whether one is dealing with

broadleaf, mixed or conifer stands. Similarities and differences in biodiversity patterns between Eastern and Western Canada's boreal mixedwoods will be presented.

## **Productivity and soil processes in boreal mixedwoods: does 1 plus 1 equal 2?**

**December 3, 2008**

Research on soil processes and productivity in pure and mixed stands will be synthesized in order to clarify how the resistance and resilience of mixedwood stands could be affected by an unmixing of the mixedwoods. A synthesis of the scientific literature will be presented to address if, in fact, productivity gains could be achieved by maintaining mixed stands within boreal mixedwood landscapes.

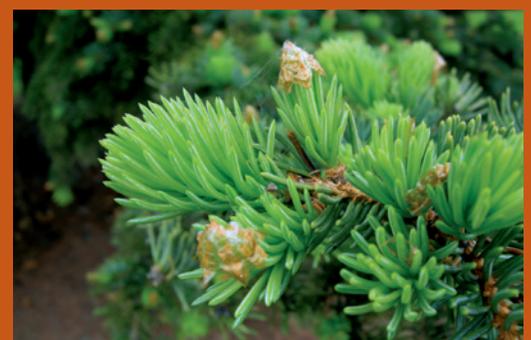
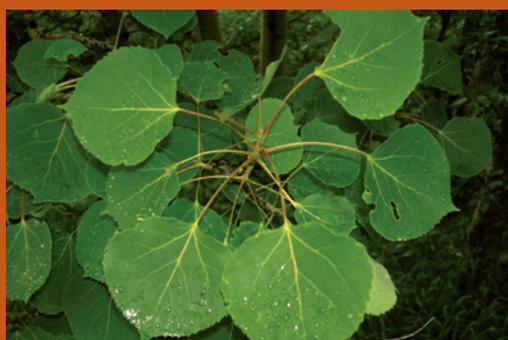
## **Mixing and unmixing of boreal mixedwoods: looking back to move forward?**

**December 10, 2008**

In the final lecture, changes in the tree composition of boreal mixedwoods in Eastern and Western Canada as the climate changed during the Holocene period will be presented. This will be followed by a synthesis of how current global climate change is expected to affect disturbance and stand dynamics in this biome. Keeping current regeneration standards in mind, certain policy strategies for Eastern and Western Canada will be presented. These strategies will focus on minimizing regeneration costs while maintaining boreal mixedwood landscapes in Canada.

French versions of the lectures will immediately follow the English versions.

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# Protected Areas and Sustainable Forest Management: Kissing cousins or family feud?

by Dr. Yolanda Wiersma

Canadians have been witness to more than a few blockades of logging roads by activists and campaigns to get logging out of areas within or adjacent to protected areas. But forestry practices have changed over the past few decades. Many attributes of sustainable forest management can contribute to conservation of biodiversity values and ecological processes in much the same way that strictly legislated protected areas do. It is no longer effective to consider protected areas in isolation of the physical, political, and economic landscapes they inhabit.

“We have to take a close look at the relationship between protected areas and sustainable forest management if we are going to have effective protection of ecological processes and features within strictly legislated protected areas,” says Dr. Yolanda Wiersma, SFM Network Principal Investigator and researcher at Memorial University.

Dr. Wiersma leads a State of Knowledge project, together with the team of Dr. Peter Duinker (Dalhousie University), Dr. Wolfgang Haider (Simon Fraser University), Dr. Glen Hvenegaard (University of Alberta), and Dr. Fiona Schmiegelow (University of Alberta). The team has been busy compiling literature germane to the subject, developing an online database and annotated bibliography, and consulting with partners and interested representatives from industry, government, non-government agencies, and First Nations. The inaugural workshop was held in Ottawa in January 2008. Two fall workshops are planned – for Halifax in September and Edmonton in October. In addition, Dr. Wiersma has conducted small roundtable discussions with representatives from industry, ENGOs, and government.

“Although we haven’t finished our consultations, some key themes are emerging,” says Dr. Wiersma. One theme is the wide range of perceptions on whether activities undertaken by the forest industry can contribute to protection values.

The team is finding case studies showing positive relations between the sectors.

The team will try to identify what factors have contributed to successful relationships and what barriers still exist. One barrier appears to be different practices between protected areas and sustainable forest management sectors. “Protected areas management appears to be more about ‘where’ questions, while sustainable forest management is more about ‘how’ questions,” says team member Dr. Peter Duinker.

In the end, protected areas and sustainable forest management share similar goals of sustaining natural systems for human benefit. However, there are differences in specific objectives and the strategies employed to achieve them. By identifying strategies to cross these divides, the project team hopes to foster better relations between protected areas and sustainable forest management.

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## ROLE OF PROTECTED AREAS IN SFM

This mini-workshop will focus on the values associated with protected areas for sustainable forest management, and the range of regulatory and policy tools that can be applied to facilitate the relationship between protected areas and sustainable forest management.

Prince George, B.C. **TENTATIVE WORKSHOP DATE  
DECEMBER 1, 2008**

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# Harmonisation of Aboriginal and Industry Interests: Can we sing from the same page?

by Dr. Stephen Wyatt

“Not necessarily” may be the shortest answer to the question of harmonising Aboriginal and industry interests. In two upcoming and linked SFM Network State of Knowledge reports, a research team led by Dr. Stephen Wyatt from the Université de Moncton is reviewing experiences of industry/aboriginal collaboration and harmonisation across Canada, as well as best practices for applying traditional land-use studies in forest management.

The research team includes David Natcher, Solange Nadeau, Ron Trospier, Luc Bouthillier, Martin Hebert and Peggy Smith. Jean-François Fortier at the Université Laval and Garth Greskiw at UBC provide research support.

Different arrangements across Canada are helping to resolve or avoid problems while providing benefits to both forest industries and Aboriginal peoples. However, each group typically has its own interests and the relationship created, whichever form it takes, will not always provide the same benefits to each side or fit the timeframes they are working within. Getting two different groups on the same page is not always possible, but the right arrangement can make it possible to reconcile different sets of interests.

The diversity of approaches used in Canadian forestry is surprising. In June, practitioners and researchers met in Ottawa to compare notes. They prepared a short-list of 40 different types of collaboration – noting that it could be subdivided even further. Industries or Aboriginal groups who wish to collaborate need to choose the right approach, one that considers the goals of each party, the critical steps in implementation, and the results being sought.

The research team is planning a framework to help organisations decide which form of collaboration best meets their needs. It has also prepared a database of papers and reports studying collaboration across Canada. The team now aims

to make this resource, initially a tool for identifying and comparing case studies, available to SFM Network partners, enabling them to access detailed information about the benefits and pitfalls of different collaborative arrangements.

In order to ensure the database reflects on-the-ground situations, the team is preparing an inventory of Aboriginal communities and the collaborative arrangements in which they are involved. This inventory shows, for example, that in Quebec there are more studies about the Cree than all other First Nations combined. Furthermore, it appears that economic partnerships have been little studied, despite being the most common type of arrangement. A workshop with Quebec First Nations also considered harmonisation and collaboration in relation to the release of a government Green Paper on forest sector reforms.

Finally, a series of key studies of various cases by different researchers is being subjected to a “meta-analysis”. This is a qualitative research technique for comparing the critical ideas and concepts of individual case studies and building them into an integrated explanation that goes beyond a single example.

An important conclusion of this project is that Aboriginal nations and forest industries must carefully choose collaborative approaches that meet their needs, while policy needs to be flexible enough to allow the parties involved to find the arrangement that works best for them.

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## SFM Network Partners

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- Networks of Centres of Excellence / Government of Canada
- Natural Sciences and Engineering Research Council of Canada (NSERC)
- Social Sciences and Humanities Research Council of Canada (SSHRC)

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- Government of Alberta (Advanced Education and Technology) (Sustainable Resource Development)
- Government of British Columbia (Ministry of Forests and Range)
- Government of Manitoba (Manitoba Conservation)
- Government of Newfoundland and Labrador (Department of Natural Resources)
- Government of Ontario (Ministry of Natural Resources)
- Gouvernement du Québec (Ministère des Ressources naturelles et Faune)
- Government of Yukon (Department of Energy, Mines and Resources)

#### Industries

- AbitibiBowater Inc.
- Alberta-Pacific Forest Industries Inc.
- Canadian Forest Products Ltd.
- Daishowa-Marubeni International Ltd.
- J.D. Irving, Limited
- Louisiana-Pacific Canada Ltd.
- Manning Diversified Forest Products Ltd.
- Tembec Inc.
- Tolko Industries Ltd.
- Weyerhaeuser Company Ltd.

#### NGO

- Ducks Unlimited Canada

#### Aboriginal Groups

- Heart Lake First Nation
- Kamloops Indian Band
- Métis National Council
- Moose Cree First Nation
- Treaty 8 First Nations of Alberta

#### Institutions

- University of Alberta (host institution)
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- Dalhousie University
- Lakehead University
- McGill University
- Memorial University of Newfoundland
- Mount Royal College
- Royal Roads University
- University
- Simon Fraser University
- Thompson Rivers University
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- Canadian Institute of Forestry
- Forest Ecosystem Science Cooperative, Inc.
- Forest Engineering Research Institute of Canada (FERIC)
- Fundy Model Forest
- Lake Abitibi Model Forest
- Manitoba Model Forest
- National Aboriginal Forestry Association

October 2008



10% POST-CONSUMER FIBER

## Vision

The forests of Canada will maintain their extent, diversity and ecological vitality and be managed in a manner that will provide for the broad social, cultural and economic needs of all Canadians.

## Mission

The Sustainable Forest Management Network is a national partnership in research and training excellence. Its mission is to deliver an internationally recognized, interdisciplinary program that undertakes relevant university-based research. It will develop networks of researchers, industry, government and First Nations partners, and offer innovative approaches to knowledge transfer. The Network will train scientists and advanced practitioners to meet the challenges of modern natural resource management.



## Newsletter Production

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