



First Issue!

Welcome to *Insights!*

Welcome to the first issue of *Insights*. This is the second of two new newsletters from the Northern Forestry Centre (NoFC), Edmonton, Alberta.

Northern Notes, launched earlier this year, features brief highlights on four current NoFC research projects.

Each issue of *Insights* will provide information on a single topic such as a

recently completed research project or significant publication, an update on older research, or a summary of activities on a particular theme such as climate change.

We hope you will enjoy reading about our latest developments and that they can assist you in your forest management decisions and help improve existing or develop new forestry practices, processes and policies.

Climate Change Adaptation – Scenarios for Vulnerability Assessment

Extending over 400 million hectares, Canada's forests and woodlands represent approximately 10% of the world's forest cover. These forests are a natural renewable resource and provide environmental, economic, social, and cultural benefits to all Canadians, whether they live in small northern communities or large urban centres. The long-term sustainability of these natural assets, and their benefits to Canadians, are being influenced by numerous interacting factors including climate change.

David Price, a researcher at the Canadian Forest Service's (CFS) Northern Forestry Centre (NoFC) in Edmonton, Alberta, has been working with colleagues within CFS and other organizations to develop and test models aimed at improving our understanding of how forest ecosystems may respond under a changing climate. David was also the lead author of a recent, comprehensive review paper, entitled: *Anticipating the consequences of climate change for Canada's boreal forest ecosystems* (Price et al. 2013), <http://www.nrcresearchpress.com/doi/abs/10.1139/er-2013-0042>.

One key conclusion of that work was that there are several potential climate-driven tipping points in Canada's boreal ecosystems that if crossed could, for example, significantly increase forest fire frequency and/or trigger rapid permafrost thawing or catastrophic outbreaks of harmful insect pests. "However, Canada's forests are also likely to be affected by more than just climate change", says David.

David's colleague, Kendra Isaac, drawing on her work with the Canadian Council of Forest Ministers' (www.ccfm.org) Climate Change Task Force, adds, "Social and economic choices made by more than 7 billion humans spread across the planet drive our future. Therefore, in addition to climate change it could be advantageous for Canada's forest sector to consider how new social expectations, new technologies and changes in urban lifestyles may affect the global demand for timber and hence the future market for Canadian wood products."

Such questions cannot be answered with great confidence, but it is important to be prepared for the possible consequences of observable trends, such as a changing climate, and by surprises, such as the economic impacts of a sudden shortage or surplus of fossil fuels.

As they seek to manage forests sustainably, forest managers have often indicated that if they could predict how future changes might affect their forests, they could better prepare for those challenges and opportunities. Unfortunately there is no crystal ball that allows accurate prediction of the future at the level of detail required for forest management planning and operations. That said, not all is lost, as tools and techniques are available to explore different potential futures and their implications on forest management activities. Scenario analysis is one such technique.

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Pine trees affected by Mountain Pine Beetle (Photo: NRCan)

Working under the broad umbrella of the CCFM's Climate Change Task Force, David and Kendra, along with other federal, provincial, and territorial colleagues, undertook a major project to review the origins and applications of scenarios in assessing the vulnerability of sustainable forest management in the 21st century (report forthcoming at <http://cfs.nrcan.gc.ca/publications>; please email David Price or Kendra Isaac for more information on this report).

In short, climate scenarios provide projections of the long-term trends and changes in temperature, precipitation and other climatic factors, based on possible future trends in atmospheric greenhouse gasses (GHG) like carbon dioxide and methane. In turn, the future trend in GHG emissions is a major uncertainty, being highly dependent upon global trends in social, economic and technological development. These socioeconomic factors close the loop between drivers of climate change and its ultimate effects. Scenarios are, therefore, an invaluable tool to help forest managers explore possible options, and hence make more robust, proactive forestry management decisions to better adapt in a highly uncertain future.

Kendra adds, "We see scenarios of the future as a critical input to assessing the interacting effects of social and economic changes — as well as environmental changes — on forested ecosystems, sustainable forest management and forest-based communities."

Exploring the likely impacts of global changes can assist forestry practitioners seeking to adapt their management activities to respond more successfully to the full range of potential changes in our forests. David concludes, "The ultimate goal of our work and our report is to make scenarios more understandable and accessible to forestry practitioners and managers working at operational, managerial and policy-development levels."

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Aussi en français

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