

Summary

Climate Change Adaptation Research Needs for British Columbia Forest and Range Ecosystems

Prepared by Sybille Haeussler, UNBC FFESC Research Coordinator (haeussl@unbc.ca) April 2009

The Future Forest Ecosystem Scientific Council of British Columbia (FFESC) was formed in 2008 to **promote research supporting adaptation of BC's forest and range management framework to the anticipated effects from climate change**. The FFESC is a partnership of the BC Ministry of Forests and Range (MFR), the University of BC (UBC), and the University of Northern BC (UNBC).

This summary presents some general findings of a research needs analysis conducted for the FFESC in January 2009.

- Research organizations around the globe are responding to the urgent need for climate change information by producing research syntheses and adaptation strategies at an overwhelming rate. Many **excellent high level assessments are available** on a wide range of topics relevant to the FFESC. Research funded through the FFESC should be compatible with the standards, frameworks, scenarios and recommendations of the Intergovernmental Panel on Climate Change (IPCC) and Millennium Ecosystem Assessment. FFESC research should build upon and scale down this high level research in a BC forest and rangeland context, rather than reinvent a made-in BC approach. The FFESC can also capitalize on the expertise of the many BC and Canadian scientists who have participated in these assessments.
- The scope of research to be addressed by the FFESC includes topics defined by the IPCC as **Impacts, Adaptation and Vulnerability** research. **Mitigation** research aimed at quantifying and reducing sources and sinks of greenhouse gases from forest and range ecosystems is also relevant, provided this research enhances effective adaptation of forest and range policy and practices. **Climate Science** that improves and down-scales projections for BC forest and range ecosystems will also help to achieve FFESC objectives.
- During the current financial crisis, much ongoing research is threatened by **funding cutbacks**. Close communication with national, provincial and regional agencies (e.g., Environment Canada, Natural Resources Canada, BC Ministry of Environment) and climate change research and funding bodies (e.g. PICS, PCIC, CIARD, CCCSN, NSERC, Fraser Basin Council) will be necessary to make the most efficient use of available research funds so important projects addressing FFESC objectives can continue and duplication of effort is minimized. Research projects that involve interagency partnerships and leveraged funding are encouraged.
- There is a high degree of international **consensus about best scientific practices** for natural and social sciences research related to climate change impacts, adaptation and vulnerability, and about the barriers that prevent agencies and societies from communicating and implementing adaptation practices. The FFESC will need to translate this knowledge into scaled-down research specific to BC's forest and range ecosystems, forest-dependent communities and forest policy framework.

- Institutional transformation is one of the single biggest obstacles to effective adaptation. Working with decision-makers and operational staff to enhance their capacity to understand uncertainty and risk, and to adopt more flexible practices is universally identified as a critical gap. There is a need to formally address **uncertainty and risk** in (1) communicating research results and model projections; (2) designing monitoring protocols; (3) recommending changes to policy and practices; and (4) working with decision-makers and communities to implement change.
- Research programs that engage user groups including decision-makers and communities from the outset are more likely to result in desired outcomes. While major progress has been made in recent years to develop analytical frameworks for practical decision-making, there are significant gaps in their application to specific problems, policies and practices within the BC forest and range sectors.
- Current research is highly segregated between the natural and social sciences, and this must change before ecological knowledge can be translated into action at the policy and community level. Economic, legal and policy analyses of BC's unique forest and range management framework are currently inadequate. A systematic evaluation of BC's land and resource management plans at all scales is also needed. The FFESC can assist in ensuring this process is operationalized using the best available science.
- Because of its ecologically diverse, publicly-owned land base and an established tradition of forest research and public forest management, BC has a scientific advantage in certain areas of climate-change adaptation research that can be exploited by the FFESC. Provincially-funded databases such as BEC are vastly under-utilized for modeling purposes. BC's highly engaged citizenry, well-established provincial and regional land use planning processes, and social networks for forestry planning are also important assets that can be adapted to the challenges of climate change. Through collaborative research, the FFESC could encourage the world's best scientific teams to use our provincially-funded research and planning networks and databases to their fullest possible extent to help solve BC and the world's climate crisis.
- Some topics (e.g., forest genetics) appear to have benefitted from a unified, collaborative interagency approach, whereas other topic areas (tree growth, disturbance dynamics, wildlife and biodiversity impacts) appear less coordinated. Forming interdisciplinary research collectives and working collaboratively on a limited number of intensive model systems is a proven route to scientific advancement. The FFESC should consider adopting one or more interdisciplinary case study ecosystems for intensive work, building on established long term field experiments and existing modeling frameworks.
- Field studies that can simultaneously provide improved parameter estimates for models and address policy or practice questions within a short time frame must take priority. There should be a systematic effort to identify the weaknesses of current climate change models that can be improved through (a) better use of existing empirical data and (b) new field and laboratory studies. Complex models or suites of models that cross scales and sectors or disciplines are urgently needed.