

*ClimateNews is a snapshot of new and emerging climate change adaptation and mitigation activities in the natural resource sector.*

#### In this issue:

- FLNR Climate Change Steering Committee
- FLNR Climate Action Plans
- Provincial scale vulnerability assessment
- Tree species diversity myth busting
- Climate friendly fish passages
- Free FLNR wood product carbon calculator
- Forest carbon management discussion paper

### New FLNR Climate Change Steering Committee

The Climate Change Steering Committee (CCSC) was formed in July 2013 to provide strategic direction, coordinated action and accountability in FLNR on climate change adaptation and mitigation work. This director level committee is leading the development and implementation of the [FLNR Climate Change Strategy \(2013-2018\)](#) across policy and operations for all natural and heritage resource areas in the ministry. CCSC also provides a coordination and liaison role with other governments, jurisdictions, agencies, non-governmental organizations, professional associations, and public interest groups. The group held their first workshop this month to put more detail to their strategic direction and test drive the Climate Action Plan process.

### Ministry-wide climate change plans to be completed over next two years

The Climate Action Strategy for 2013-2018 is action-oriented towards adaptation and mitigation at the provincial level. It outlines three goals and nine objectives for effectively responding to the impacts of climate change over the next five years and beyond. The ministry's three goals are:

1. **Climate change is integrated in ministry core business;**
2. **Climate-relevant science, data, and knowledge guide and inform the identification of the ministry's environmental, social, and economic**

**risks, opportunities, and priorities for climate change action;**

3. **Climate change action is undertaken through collaboration, partnerships, communication, and outreach with BC's First Nations, communities, and natural resource sector.**

A first step towards unified sectoral action on climate change is the requirement that all FLNR regions and branches (including BCTS) develop climate action plans to address the goals and objectives of the Climate Action Strategy by March 31, 2015.

To facilitate action, the Climate Change Steering Committee will work with high priority/early adopting regions and branches to develop draft climate action plans by March 31, 2014. The committee will oversee the entire process and the [Competitiveness and Innovation Branch](#) will provide advice, guidance, and tools to assist the process.

### Provincial scale vulnerability assessment complete

[The Provincial Vulnerability Assessment](#) provides an assessment of the vulnerability of BC's managed forests to climate change. A vulnerability assessment is an examination of the impacts, exposure and sensitivity of ecosystems and ecological processes to a changing climate. This vulnerability assessment is a high level view of the vulnerability of hydrology and aquatic biology, soils, forest ecosystems and wildlife in BC to climate change driven shifts in temperature, precipitation



and natural disturbance processes.

The assessment draws upon three regional case studies that assess

climate change vulnerability and potential adaptation actions. The report includes common

regional adaptation strategies and recommends steps to increase adaptive capacity.



### NEWS Bite

In the recent [NR Learning Series session on the Water Act Modernization Project](#), changing climates were noted as a major consideration for BC water sustainability.

## Government briefed on the state of the physical science from the IPCC 5<sup>th</sup> Assessment Report (AR5)

Climate scientists briefed 170 staff from 12 ministries plus local and federal government representatives on the Report on the Physical Science Basis (led by Working Group I or WGI) for the [Intergovernmental Panel on Climate Change's](#) (IPCC) Fifth Assessment Report (AR5). The IPCC is the leading international body for the assessment of climate change. It reviews and assesses the most recent scientific, technical and socio-economic information produced worldwide relevant to the understanding of climate change. It does not conduct research nor does it monitor climate related data or parameters.

Presentations from the [Pacific Institute for Climate Solutions](#), the [Pacific Climate Impacts Consortium](#) and Environment Canada's [Canadian Centre for Climate Modeling and Analysis](#) highlighted the calibre of climate change research headquartered in Victoria. Seven of the ten Canadian scientists that contributed to the Report on the Physical Science Basis for AR5 (WGI) are based in Victoria. In total, 259 scientists contributed to the report for WGI.

Major messages from the briefing include:

- The Earth's climate is changing and the human influence on this change through the release of greenhouse gases is unequivocal.
- Humans have already emitted approximately half of the amount of carbon allowed to keep below a 2°C global temperature increase (widely regarded as the upper limit of warming to which

earth systems upon which humans rely could reasonably adapt).

- In BC, a high variability in weather is expected to continue with an increased frequency of extreme events.
- Of the full range of scenarios presented in AR5, the worst case scenario is the one we are now tracking toward globally. Significant emission reductions will be required to change that.

Topics during the engaging question and answer period ranged from effective communication strategies, appropriateness of our education system to address climate action and concern about the current direction of the BC economy. For more information, visit the [IPCC Summary for Policymakers and full report](#) and [PCIC British Columbia Climate Facts](#).



## Adapting to climate change: Using tree species to hedge our bets - part 1

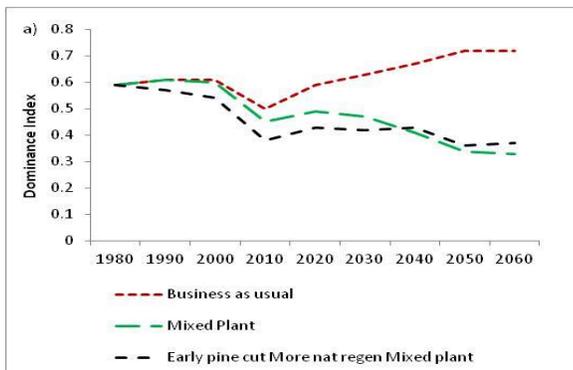
A team of FLNR researchers completed a study that concludes tree species diversity increases forest resilience and reduces risks of damage by pests and disease. The results are important when considering management practices to adapt forests for resiliency to climate change because increased disturbances are expected.

The current management regime in the Merritt Timber Supply Area (TSA) and numerous parts of the province include harvesting many species and replanting predominantly lodgepole pine (State of the Forest Report, 2010). One aspect of the study examined whether other practices could increase the overall landscape diversity of tree species, and the biophysical and economic implications of such changes. An unexpected finding was that, over the long term, management practices that increased forest resiliency were preferable from both a socio-economic and biological standpoint!

The mountain pine beetle epidemic was used as a proxy scenario for climate change impact. Through a simulation model of the forest ecosystem from 1980

to 2080 by Ecora consultants, different management regimes were run to determine their effect on the forest landscape. Caren Dymond and Sinclair Tedder led the analyses of biophysical factors such as diversity, resiliency, and harvest rate and economic factors such as net present value and costs and revenue per cubic meter for all scenarios.

In 1980, the Merritt TSA was naturally a pine-dominated landscape. The management strategy that increased the tree diversity the quickest included an early increase in the amount of pine cut, mixed planting, and increased natural regeneration through partial harvesting. This regime resulted in the greatest ecological resilience and highest post-beetle harvest rates.



The Berger-Parker Dominance Index gives the ratio of the dominance of any individual species over the total species area. A higher dominance index in these results indicates greater lodgepole pine dominance and therefore less species diversity and forest resilience.

Another interesting finding was that relying only on mixed planting to increase diversity was not as effective as strategies tailored to the unique needs of the Merritt TSA. As a pine dominant area, the Merritt TSA benefitted from the targeted reduction in the lodgepole pine as a high risk species.

The researchers were excited to find that management plans increasing species diversity were also the most economically attractive in terms of net present value, per unit value returns on timber harvests, and costs for harvesting per cubic metre.

The next edition of ClimateNews features the study's results of adaptive management for an already diverse ecosystem!



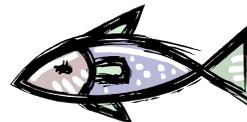
**Climate change adaptation will cost more than our current management strategies**



**All we need for increased forest diversity is a mixed planting management strategy**



**Greater diversity supports forest resilience**



**Climate friendly fish passages**

Craig Mount and Richard Thompson (members of the [Fish Passage Technical Working Group](#)) recently attended a [Fish Passage Conference](#) in Oregon. In addition to benefitting stream habitat, fish passages can support adaptation to climate change by allowing fish access to a full range of habitats and reducing the risk of failures of road infrastructure due to changing climatic conditions.

This US Forest Service [paper](#) demonstrated that structures that constitute fish friendly stream crossings (open-arch, with streambed simulation) are more flood-resilient and have lower risk of failure in extreme weather events. Undersized culverts caused millions in damage in the northeastern US during the tropical storm Irene in August 2011; four towns collectively lost 70 stream crossings. To repair one is \$1 million. However, the few crossings installed with stream simulation design culverts survived the same storm without damage.

The BC Government is actively implementing a strategic approach to restoration of fish passage at

road crossings in BC. Current funding has allowed 10 crossings to be fixed per year. As partnerships are developed and increased awareness of the benefits of fish passage restoration become known, the Fish Passage Technical Working group hopes more undersized structures are replaced with fish friendly designs. For more information, check out Craig and Richard's presentation on the [state of BC's fish passages](#).



**NEWS Bite**

Free FLNR Carbon Calculator estimates the carbon footprint of wood products used in North America. Created by Caren Dymond and Larry McCulloch, it determines CO<sub>2</sub> emissions of wood products used over time. Data on logs, lumber, plywood, or panels are automatically converted into tonnes of CO<sub>2</sub> equivalent. Information is then provided on total carbon storage and emissions for each product used, where products end up and how the carbon levels change over time. Graphs visually portray carbon flux over a 100 year period. The quick results section allows easy understanding of how a change in inputs affects 100-year carbon storage and emissions. [Download the Carbon Calculator here.](#)

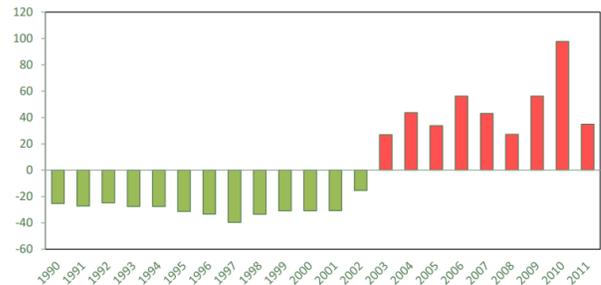
**FLNR releases discussion paper on forest carbon management in BC**

[Forest Carbon Management in BC: A Discussion Paper](#) describes climate change mitigation opportunities resultant from the substantial forest resource in BC and strategic direction regarding this unique forest value. Due to forests' ability to absorb and store carbon, forests and the forest sector in BC can affect the atmospheric concentration of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases (GHGs) attributed to cause climate change (see graph).

The paper addresses key considerations of forest carbon management:

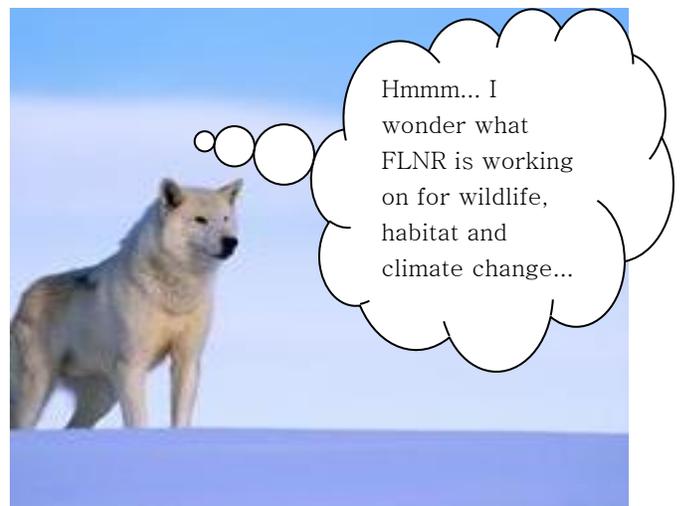
- existing forest management
- forest carbon science

- management strategies that optimize forest values including carbon
- synergies with existing provincial initiatives
- current direction on forest carbon management



This figure shows the approximate annual balance of CO<sub>2</sub>e (carbon dioxide equivalent) in BC forests based on the accounting rules of the IPCC. Between 1990 and 2002, forests were a net sink for carbon (green). They took up more carbon than they released to the atmosphere. In 2002, this changed and they became a net source for carbon (red). They released more carbon into the atmosphere than they could take up.<sup>1</sup>

The province supports forest carbon management options that satisfy the diverse values British Columbians seek from forests. This includes ecological values (e.g. biodiversity, water, fish and wildlife) and socio-economic values generated by harvesting, processing and manufacturing wood products.



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<sup>1</sup> Data for this graph is from the Environment Canada, National Greenhouse Gas Inventory Report, 2013.