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

In this issue:

Carbon offsets restore damaged forest land

What's so special about 19,000 trees planted on provincial forest land in Quesnel in May and June? This planting project is not typical reforestation. It's a result of a partnership between B.C. and Prince George-based Carbon Offset Aggregation Cooperative (COAC) to restore forest damaged by Mountain Pine Beetle and fire. In exchange for planting Crown forest, COAC gains ownership of carbon offsets: the value of the atmospheric benefits generated by the trees planted. Individuals and organizations that fund COAC's planting can then use or sell these carbon offsets to reduce their carbon footprint.

The opportunities for this kind of planting are huge given the vast area of insect and fire-damaged forest in B.C. that could benefit from restoration. B.C.'s agreement with COAC to plant more trees over the next five years is an initial step in a promising program. For more information contact Brian Raymer.

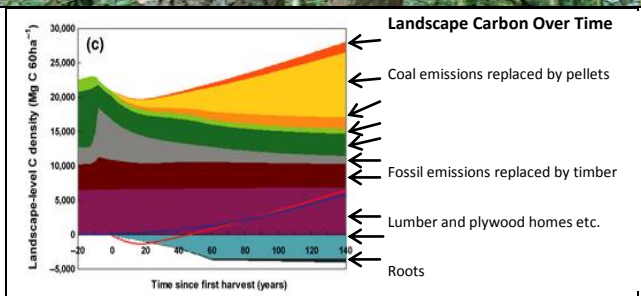
Climate benefits are also created when logging residue (i.e. uneconomic fibre left over after logging) is substituted in place of fossil fuels for energy generation. The next story describes a related study.

Bioenergy from wood pellets mitigate climate change

Scientists at FLNRO and Utrecht University recently assessed whether making wood pellets in B.C. for electricity generation in Europe is a net benefit to the atmosphere (i.e. does it add or remove carbon pollution). This work is pertinent to B.C.'s forests because our forests are now a major source of pellets exported to Europe to replace coal in electricity production. Because trees take up carbon from the atmosphere as they grow, it's important to understand the carbon implications of practices like bioenergy export when making management and policy decisions. Key findings are summarized below.

- Some current practices (e.g. burning logging residue and only using sawdust for pellet production) require 20-25 years to accrue a net carbon benefit.
- If logging residue was used to make pellets (a small but growing part of the industry) and replace coal for electricity generation, it would:
  - shorten the time it takes to reach pre-harvest carbon levels by 9-20 years; and,
  - instantly result in a net carbon benefit from areas most severely impacted by the beetle because large amounts of wood would displace coal instead of being burned on site.
- Logging beetle-impacted sites for lumber and using harvest residue for bioenergy created a greater carbon benefit than forest conservation.
- Logging stands exclusively for bioenergy led to a net carbon source to the atmosphere unless they contained a high proportion of dead trees (>85%).
- Stands or landscapes with more than 15% living trees provide the largest atmospheric benefit when used for lumber or similar long-lived wood products.

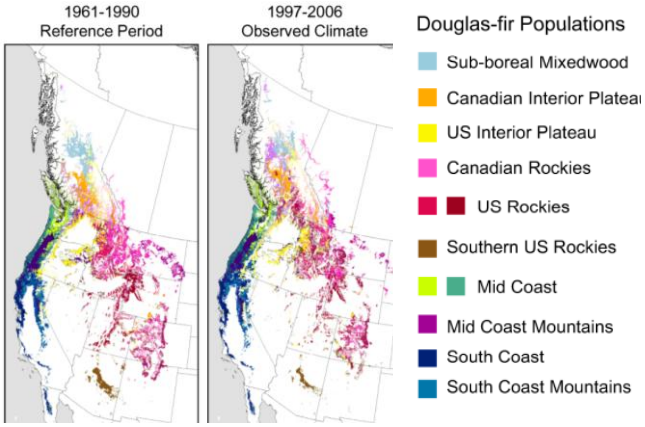
Study co-author Caren Dymond expected the fossil fuels used to ship pellets through the Panama Canal would outweigh any benefits of using logging residues. She was surprised and delighted when analyses showed positive results for the atmosphere. This unexpected result was due to the large volume of coal being replaced and the efficient supply line. The freighters back right up to the power plants! The paper is freely available at GCB Bioenergy. Below is a graph showing the carbon benefits of using wood to replace fossil fuels.



The carbon stocks for a hypothetical landscape with severe beetle-kill. The top two yellow and orange bands show the replacement benefit of using wood instead of fossil fuels for energy or construction.

Tracking suitable habitat for tree populations

Climate is changing an order of magnitude faster than most tree species can move or adapt. In a recent study, Laura Gray and Andreas Hamann[1] asked how far tree populations already lag behind their optimal climate habitat, and how those differences may increase in the future. They found, on average, that ecosystems already lag behind their optimal climate niche by approximately 130 km in latitude, or 60 m (200 ft) in elevation. By the 2020s, this will increase to 310 km in latitude and 140 m in elevation.



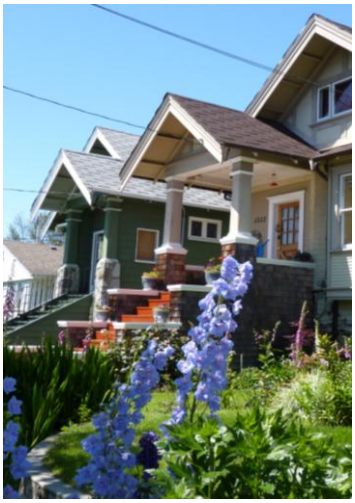
The map shows ecozones (used to represent the habitat of individual populations of Douglas-fir) for the 1961-1990 reference period (left) and under recent climate change 1997-2006 (right). Differences between the two maps illustrate the lag in the migration of species to optimal climate zones.

Matching planting stock with anticipated climatic conditions is important for survival, growth, and productivity of plantations, carbon storage, and other forest values. To address this issue, the B.C. MFLNRO Tree Improvement Branch introduced changes to seed transfer standards in November 2008. These changes included increases to upward elevation limits (100-200m) for the majority of B.C.'s commercial tree species. More information here.

[1] Department of Renewable Resources, University of Alberta

Rehabilitating buildings for climate action

Can retrofitting existing buildings benefit the environment and reduce emissions? A 2011 study used life-cycle analysis (LCA) to analyze indicators for climate change, human health, ecosystem quality, and resource depletion, and test different types of buildings in Portland, Phoenix, Chicago, and Atlanta. The study found:



- Building reuse almost always has fewer environmental impacts than new construction when comparing buildings of similar size and functionality;
- Reuse of buildings with an average level of energy performance consistently offers immediate emissions reductions compared to more energy efficient new construction; and,
- Materials matter: the quantity and type of materials used in a building renovation can reduce, or even negate, the benefits of reuse.

In B.C., MFLNRO's Heritage Branch is taking action to reduce emissions by addressing legislation, policy and partnerships that support retrofitting of existing buildings.

Heritage Branch's work in this area is varied. They are modeling best practices for improving the energy efficiency of historic homes and developing and influencing policy. For example, the *New Energy Efficiency Act* enables historic places to meet new green standards using traditional construction approaches.

Additionally, they worked on a new 'Energuide' building standard that stimulates whole-building thinking, rather than relying on prescriptive standards that could compromise character and

generate unnecessary alterations.They are also leading a federal/provincial/territorial initiative to develop illustrated guidelines for the role heritage plays in environmental sustainability.

Recently, in partnership with the Real Estate Foundation of B.C., the branch sponsored presentations by the Cascadia Living Future Institute to construction and planning professionals on upgrading heritage buildings and the environmental value of building re-use. The series reached 200 rehabilitation specialists across B.C..

Tools for Adapting Forest Stewardship to a Changing Climate

New Policy Guidance for addressing long-term forest health in stocking standards

In April, Tom Ethier, MFLNRO Assistant Deputy Minister issued new guidance on Consideration of climate change when addressing long-term forest health in stocking standards. This memo makes it clear that the impacts of climate change need to be considered as part of the long-term forest health test both by those preparing Forest Stewardship Plans and those reviewing them.

NEWS Bites

B.C. partners in Landscape Conservation Cooperatives

B.C. is a partner in three US Department of the Interior's Landscape Conservation Cooperatives (LCCs). Twenty-two LCCs cover the US and beyond:

- *Great Northern LCC*: interior B.C., Alberta, Idaho, Montana, Oregon, Washington and Wyoming. Contact Madeline Maley for GNLCC and NW Boreal LCC.
- *North Pacific LCC*: coastal B.C., Washington Ore., N. Calif., and Alaska. Contact Rory Annett.
- *Northwest Boreal LCC*: boreal forest in Alaska, the Yukon, B.C. and Northwest Territories.

LCCs aim to better manage cross-jurisdictional landscape challenges. Each unit includes federal agencies, states, Tribes/First Nations, non-governmental organizations, and universities who collaboratively define science needs, leverage resources and jointly address broad-scale conservation issues like climate change.

FLNRO's partnership in LCCs is an opportunity to share research related to climate change adaptation and inform natural resource management decisions.

NRS Learning Series - September Session Covers Forest Carbon Projects

The NRS Learning Series is hosting a climate change mini-series. June's session saw FLNRO speakers discussing cumulative effects, vulnerability assessments and climate action and heritage buildings. September's session features MARR's work on First Nations forest carbon projects and FLNRO's innovative forest carbon program. Details to come.

Natural resource professional associations join forces on climate action

PICS and West Coast Environmental Law student intern, Nivi Ramaswamy are working with B.C.'s forest professionals, and professional agrologists, biologists, engineers and geoscientists to assess professional associations' climate change adaptive capacity and needs. Deliverables include: a needs assessment, an online community of practice for case studies, best practices and guidance, and a joint statement on professionals' roles and responsibilities. ClimateNews will report on the project's findings when complete.

What other noteworthy FLNRO initiatives are incorporating a climate change lens? Send your answer to katharine.mccallion@gov.B.C.ca