



# FORESTS AND CLIMATE CHANGE FORUM

Day I Proceedings

Canadian Boreal Initiative/Ivey Foundation  
Forests and Climate Change Forum  
October 15<sup>th</sup> to 17<sup>th</sup>, 2007

Kananaskis, Alberta

IVEY foundation



**DAY I** The following are brief summaries of the presentations made on day one of the Forum. More detailed information on each of the subjects discussed can be found by following the links provided to individual speaker presentations and by reading the Forum’s “Forest Carbon Sequestration and Avoided Emissions” background paper.

**Forests and carbon** Forests store carbon in more than just trees. In fact they contain a number of different carbon “pools” that differ in size and longevity. The smallest pool with the shortest lifetime is the standing woody biomass. The largest pools with the longest storage timeframes are soils, peatlands and lakebeds. Within northern ecosystem as a whole, permafrost areas are also important carbon storehouses.

There has been a lot of focus on forest’s role as source or sink, but their real service is long-term storage. The carbon stored in forest systems can be compared to a bank account that experiences deposits and withdrawals. It is the long-term trend that matters -- is the bank account growing or shrinking? – rather than the annual fluctuations.

Forests are estimated to store half of the world’s carbon and the boreal forest alone stores 23%, while the living plant biomass alone in the world’s forest is equivalent to two years of annual global GHG emissions.

Deforestation is a major contributor to CO<sub>2</sub> emissions worldwide and represent about a quarter of global GHG emissions. Carbon released annually due to forest loss is equivalent to global emissions from natural gas usage. However, deforestation is a relatively minor source in Canada, where deforestation is estimated to be in the range of 50,000 hectares a year. In Canada, oil and gas and large hydro development are the biggest contributors to deforestation.

Within northern forests, the greatest potential cause of increased carbon emissions is disturbance of forested peatlands and hydrological changes (higher water table,

flooding, wetland loss) that affect peat carbon storage. (The exception to this is coastal rainforests, where living trees have a carbon storage volume and lifespan that may approach that of peat).

Currently, we have a very limited understanding of the broader role forests may play in regulating climate through things such as transpiration or the albedo effect. There is some research being done on this at the University of Victoria. The Albedo effect would really only be important in a case of large-scale afforestation of non-forested areas. Northern movement of tree line would be the most relevant example in Canada, because the vast majority of reforestation is taking place in already forested areas.

Protecting forested areas keeps large carbon deposits undisturbed and allows long-term accumulation of carbon to continue.

See for more information

- [Synopsis of Climate Workshop \(Chris Henschel, CPAWS\)](#)
- [Forests and Carbon: Opportunities for Climate and Conservation Benefits \(Stewart Elgie, University of Ottawa\)](#)

**Kyoto and forests** The current Kyoto Treaty rules do little to promote forest conservation or good forest management in northern forests. CDM credits are only available for afforestation efforts (the planting of permanently deforested areas) in developing countries and the current carbon accounting rules do not distinguish between carbon changes that are natural or anthropogenic in origin.

The result is that on a national basis, any management or conservation efforts designed to increase carbon storage (e.g., lengthening rotation ages, increasing buffers, protecting soils and peatlands during logging) are easily swamped by natural fluctuations (e.g., forest fires, insect outbreaks, windstorms). Canada, for example, found that it would be in a highly negative carbon position if it invoked the Kyoto Treaty's optional Section 3.2 (inclusion of managed forests in carbon accounting) due to the cumulative impact of mountain pine beetle damage and increased forest fires over the last decade and a half.

It would be very difficult to affect (or control) natural forest disturbances that release carbon. Countries could increase fire suppression efforts or institute large-scale insect control programs, but these are likely to be quite costly and of limited effect. However, it is also true that human activities like fire suppression have increased the risk of natural events like fire and insect outbreaks. And human-activity induced climate changes, such as hotter, drier weather, are also directly responsible for increasing risks.

What we can better control are the impacts of forest management activities on carbon storage. Lengthening rotation ages, protecting soils through equipment changes or winter logging, increased tree and coarse woody debris (CWD) retention, reduced fragmentation, and smaller operational areas (or increased buffers) are all examples of activities with the potential for increasing carbon storage. Protecting the integrity of forested peatlands probably trumps all of these in potential carbon benefit. We could also endeavour to make forests more fire or insect "proof" by creating more natural forest conditions.

Current Kyoto rules do not provide credit for carbon storage in wood products. The wood product pool includes products with significantly different carbon storage lifespans, from newsprint to furniture. But, on average, the products pool is estimated to have an average lifespan that is similar to that for standing timber. Issues around the inclusion of products as a pool to offset other emissions include secondary emissions from manufacturing and transportation, product substitution (e.g., is a wood 2 x 4 being used instead of an emissions-intensive steel 2 x 4) and who should account for the eventual disposal (and decay) of the product (producer or consumer; exporting or importing country). An equally important substitution consideration is greater use of recycled or re-used products. Some secondary emissions are accounted for already under national accounting for manufacturing and transportation, but these are not directly linked to forest sector. Therefore, there is not a clear picture of the net carbon contribution from products, which may well be close to zero.

See for more information

- [Forests and Carbon: Opportunities for Climate and Conservation Benefits \(Stewart Elgie, University of Ottawa\)](#)
- [Tradable forest offsets: their effectiveness in climate change mitigation \(Martin Von Mirbach\)](#)
- [Forests and Carbon on the International Stage: Canadian roles in policies and agreements \(Paul Graham, Natural Resources Canada\)](#)

**Carbon credit trading – what can it do for forests?** The first consideration is whether carbon credit trading is taking place under a regulated cap and trade system or under a voluntary system. Under true cap and trade, an entity can only exceed its allowed emissions thresholds if it purchases credits from another capped entity whose total emissions are less than its threshold.

There is an important philosophical difference between cap and trade and voluntary offsets systems. Cap and trade is a polluter pays system that promotes “behaviour modification.” A credit system is essentially a “pollution pays” system where the credit seller benefits from continued emissions.

Under a voluntary offsets system, an entity purchases credits from another entity that has taken actions to reduce GHG emissions (e.g., planted trees in a deforested area; produced zero emission wind power that is displacing coal power). Neither entity is operating under GHG emission limits and therefore it is possible that the purchasing entity could increase its total emissions even after purchasing offsets (by expanding production, for example).

There is little dispute among ENGOs that a true cap and trade system is preferable in terms of climate impact. A cap and trade system mostly eliminates issues such as additionality and leakage and verification is also usually more straightforward. This approach is also more likely to result in absolute GHG reductions.

The key thing to consider about all trading systems is that the seller is agreeing to act on behalf of the buyer or, in other words, is substituting its actions for the inaction of the buyer. Therefore, it is critical that the trade result in real, measurable emission reductions. A good rule of thumb is that it is better to avoid emissions than to offset emissions: offsetting at best results in a neutral outcome and poorly applied can result in continued emission increases.

A key issue for forest-based credits is how to ensure they do not remove the incentive for reductions in fossil fuel use or undermine fossil fuel use reduction initiatives by driving the price of credits down and/or by flooding trading market with low-cost credits. Any company pursuing a credit purchase should be required to demonstrate serious efforts to reduce fossil emissions as a precursor to using credits.

Carbon credit trading could, however, be a way of providing financial resources for forest conservation projects or could incent actions that have conservation benefits (e.g., longer rotations). However, it could also result in less desirable applications:

- Conversion of other natural areas to plantations
- Insect control programs (including use of pesticides)
- Salvage logging to reduce regeneration lag time
- Increased harvesting or plantation development to support biofuel production

These sorts of activities could be seen as carbon positive but biodiversity negative.

In assessing the effectiveness of credit producing projects, we need to consider:

- Measurements and baselines: How accurately can the carbon impact be measured and how accurate is the baseline information?
- Permanence: How easily or quickly can the action that resulted in carbon sequestration or avoided emissions be undone?

- **Additionality:** How clear is it that this project resulted in emission reductions that would not have occurred in the absence of credits?

Other issues include “free riders” (essentially, a question of additionality) -- those who get credits for actions they would have taken in any case. (For example, a private landowner receives credit for avoided deforestation for a woodlot they had no intention of cutting). There will always be pressure to invoke weak rules around additionality to allow the greatest number of projects to benefit from credits.

There is a risk of rewarding laggards. If poor management has left a company with significantly more room to improve management practices than a company that has operated under best practices, the former could be able to earn more credits than the more responsible competitor.

There are some competing views on whether pursuing FSC certification could be used to earn carbon credits? Some thoughts:

No – there is no additionality; the company is doing what it must do in any case to meet FSC standards.

Yes – Its actions are above and beyond what is required in provincial forest guidelines.

Yes – Chance to earn carbon credits can push a company to take additional actions and will give certification better long-term security/viability.

No – What percentage of these actions is truly additional? What is to stop companies from adopting artificially low baselines to increase additionality? We were only going to do X, but now we will do X +Y (whereas might have done X and Y in any case in absence of credits).

Forest protection projects may be stronger candidates, but have their own set of problems:

- Not permanent. A forest fire or insect outbreak could quickly release carbon.
- Hard to measure. Measuring forest carbon uptake is more difficult than simply measuring emissions reductions from energy conservation or energy source substitution (wind vs. coal).
- High leakage. Difficult to ensure that carbon gains from protecting one area are not being undermined by increased logging in another area.

One rule of thumb is that the smaller the area, the more difficult it is to ensure permanence and prevent leakage.

However, there are some actions that could be taken to address these issues:

- **Permanence:** Develop an insurance-type system where any unforeseen losses must be replaced by insurer (could be government) or discount the value of the credits to reflect uncertainty. Here it is important to ensure the carbon reduction as much as the financial cost of the credit.
- **Measurement:** Train and certify credible 3<sup>rd</sup>-party verifiers.
- **Leakage:** Develop good entity-wide baseline data and apply discount rate to address uncertainty or likely leakage factor.

In targeting areas for carbon conservation projects, conservationists should look for areas that are economically marginal for forestry and/or have high conservation value.

It was suggested that the “best recipe” for forest carbon retention is to:

- Increase conservation of intact areas
- Move to more intensive forest management on a smaller land base
- Increase use of recycled wood and paper products

Economic modeling suggests that a carbon price per tonne of \$25 or more will have the greatest impact in spurring conservation of intact areas (by moving forestry onto a smaller land base). However, this hypothetical model does not include real-world considerations like the capital invested in mills that require wood supplies or regulatory requirements (particularly cut levels), so the impact could be less than predicted.

In developing a forest-based carbon credit system, we need to consider:

- How it can be worked into forest management rules
- Inclusion in land-use planning processes
- Whether government is willing to provide incentives to seed market

At an operational level, we must ensure the system:

- Results in gains that are real
- Does not dilute impetus for fossil fuel use reductions
- Limits or avoids biodiversity impacts (or that results in co-benefits)
- Addresses community impacts, such as jobs and revenues from forestry operations

To avoid creating a flood of cheap credits that undermine the market for fossil fuel credits, the best approach may be to limit the volume of forest based credit available in proportion to the contribution of forests to global emissions (e.g., 20-25%). Another approach would be to create separate trading systems for forest based and fossil based credits. The limitation of this option is that it severely curtails the potential revenue available for purchasing forest credits.

However, it is clear that carbon credit trading is already picking up momentum and that “the horse has left the barn.” But one of the unresolved questions is how forest offset credits are to be allocated, especially with regards to First Nations. The Innu of Labrador, for example, have suggested to the Government of Labrador that revenue from credits should be put into a local fund to support improvements in forest management (move to multi-cohort management), training and local infrastructure.

Other factors affecting the usefulness of credits will be the degree to which projects are exposed to credit price fluctuations and the degree to which tenure systems support or hinder carbon-based projects. Longer term area-based tenures may be more suited to carbon sequestration projects because they will give companies the security to invest in longer term carbon storage initiatives. While such projects could be undertaken in a volume based system (within the appropriate regulatory environment), it would be more difficult to decide who actually “owns” the credit under such a system.

Something that no credit system currently takes into account is any climate change mitigation benefits that may accrue from forest conservation projects. (Similarly, for other non-carbon climate regulation services.)

One hypothetical case-study model examined the impact of a carbon trading system on a woodlot owner where the owner is rewarded for increases in carbon storage and penalized for decreases relative to a pre-determined baseline. It found that higher carbon prices would lead to a situation where it was equally economically advantageous to not log as to log the forest. The model found that the greatest economic gains would be made where carbon stocks were relatively low at the baseline point in time (e.g., forest is younger) than for a relatively mature forest with high existing carbon levels.

See for more information

- [Forest Carbon Pricing in Canada: A Climate Advocacy Perspective](#) (Mathew Bramley, Pembina Institute)
- [Forests and Carbon: Opportunities for Climate and Conservation Benefits](#) (Stewart Elgie, University of Ottawa)
- [Tradable forest offsets: their effectiveness in climate change mitigation](#) (Martin von Mirbach)
- [Use of Carbon Offsets to Support Forest Conservation in the Certification Context](#) (Julianne Baroody, Rainforest Alliance)
- [Sustaining Nitassinan — Ecosystem-Based Forest Management and Carbon Values: Planning for a Conservation-Based Economy](#) (Valérie Courtois, Innu Nation)
- [Carbon pricing mechanisms and the optimal forest harvest age](#) (Glen Armstrong, University of Alberta)
- [Ownership/Tenure Issues In Forest Carbon Management](#) (Paul Griss)

**Conservation offsets** Another approach is to trade “land use disturbance” rights rather than carbon rights. These “conservation offsets” could be very useful in situations like the Tar Sands, where reclamation to anything resembling a natural ecosystem is highly unlikely. Requiring companies to acquire such offsets puts land disturbances on a level playing with air and water impacts (e.g., much stricter rules in place around air and water impacts than land impacts currently).

There are a number of examples of this approach: Wal Mart has committed to offsetting its current and future land development footprint with 1:1 “priority” natural area protection; Suncor has a project to offset land impacts of tar sands expansion (\$1 million to Alberta Conservation Association to acquire conservation lands – expected to protect 470 acres); and EnCana has a project for offsetting large footprint of Jonah shallow gas project in Montana with a 3:1 offset ratio (expected to cost \$16.5 million).

In terms of additionality, projects that restore previously disturbed areas would be preferable and there is approximately 100,000 hectares of previously disturbed area in northeastern Alberta from oil and gas activities.

Equivalency is a difficult issue for conservation offset projects. Key issues are proximity of restored or protected lands to area of disturbance (preferably within the same ecoregion); size equivalency (offset ratio); and biodiversity levels (are the areas similar in this regard or is offset area richer?).

These issues are similar to those identified in the discussion about the relative merits of regulated cap and trade vs. voluntary carbon offset programs. It is clearly preferable to prevent disturbance rather than offset it, if at all possible. Similarly, steps must be taken to minimize disturbance and demonstrate aggressive reclamation even with offsets in place. As with carbon offsets, conservation offsets will work best in a regulated cap-and-trade environment and in conjunction with comprehensive land-use planning.

One key difference is between the costs of going “land neutral” and “carbon neutral” through offsets. A Pembina study suggests, for example, that tar sands projects could go “land neutral” for as little as 2.4 cents per barrel of oil produced compared to anywhere from \$1.76 - \$13.65 to go carbon neutral.

For both land and carbon offset projects, the concept of “no net loss” could be useful in ensuring projects do not have negative biodiversity impacts.

- [Terrestrial and Carbon Offsets \(Simon Dyer, Pembina Institute\)](#)

**The California experience** The California Carbon Registry was established in 2001 as a way for leading-edge companies to publicly track their efforts to reduce GHG emissions (it has mostly been used by big utilities). The registry allows participants to record entity wide emissions or project specific emissions.

The motivation to use the Registry was a government commitment to companies that they would get credit for these early actions under any eventual regulatory system. The registry is not a trading market, but rather a public-private partnership between business, ENGOs and the State of California. However, it has a major role under new State climate legislation. The State Air Resources Board (ARB) has responsibility for implementing California’s new Global Warming Solutions Act. The Registry will be responsible for tracking emissions under the ARB-designed system.

Under an earlier legislative order, the Registry was instructed to develop reporting and certification protocols for forest projects. To qualify projects had to be:

- Secured by a permanent conservation easement
- Provide for the regeneration, conservation or promotion of native species
- Require natural forest management—a practice that promotes mixed species, of multiple ages

The registry began developing forest protocols in 2003 and its draft protocols have undergone extensive review, internally and externally.

Any California forest landowner that owns 100 or more acres is eligible to report under the registry’s forestry protocols and must report both biological and non-biological emissions. They must also develop an entity-wide baseline, which helps to identify potential leakage. Reporting includes:

- Required carbon pools—all live tree carbon down to 3” trees (including branches and roots), dead carbon, both standing and snags and down
- Optional pools include herbaceous understory, soil, litter and duff and wood products (soil and leaf litter could soon be mandatory).

Changes in carbon balance are then calculated for three types of projects:

- Reforestation—planting of trees in areas that were historically in forest cover (out of forest cover for last 10 years)
- Conservation—avoided deforestation/conversion to non-forest use (development application, subdivision plan, etc.)
- Conservation-based management—projects based on changing management practices on working forests (must exceed requirements of State Forest Practice Rules).

The applicant must demonstrate that the actions they are planning to take are voluntary and additional (not legally required) and must account for emissions associated with all project activities.

The Registry is working on refinements that would more strongly link conservation easements to carbon stocks to better ensure permanence and is looking to better capture market leakage, possibly through credit discounting.

All projects must undergo 3<sup>rd</sup>-party verification, which adds significantly to landowner expense. Registry is interested in finding ways to reduce these costs (e.g., combine with FSC certification).

Currently, the system is best suited to private land projects. Hurdles for public land managers include easement requirement and establishing baselines for large areas. Protocol developers are also looking at best way to establish measurements for the wood product pool and have concluded that determining ownership is probably the biggest hurdle.

This system has clearly set the pace and is now informing other efforts to develop forest credit systems, especially within the Western Climate Initiative, which is modeled after the California experience and where British Columbia has the lead on forest protocol development

- [Forest Conservation and Carbon Policy: The California Experience \(Sam Hitz, California Climate Registry\)](#)



IVEY foundation

