

**What's critical to consider in the wide world of forest carbon?  
Measuring carbon, the state of markets, and opportunities.**

April 26, 2023

No matter whether your interest is principally in measuring forest carbon to sell as offsets, or because you intend to make some claim about the climate benefit of the forest that you have protected or stewarded – many of the same rules around forest carbon apply. In either case, you need to know how to correctly inventory forest carbon and know how to talk about that carbon in the right language (and what you can and cannot claim in terms of benefits to the climate).

**I. Introduction to forest carbon**

Elemental carbon is **sequestered** through photosynthesis in plants and trees and **stored** in the living tissues (roots, leaves, trunk, branches) of those organisms. When a tree dies and begins to decompose, the carbon in that dead wood is slowly incorporated into the forest floor and soils, and a portion is slowly released back into the atmosphere. These different parts of the forest ecosystem represent different **carbon pools**, some of which (such as the herb layer or forest floor) are considered relatively small pools in the total forest carbon budget. Others, such as soil carbon, are known to be significant carbon pools, but complicated and/or prohibitively costly to inventory (as a result, they are included only as an optional pool in most Improved Forest Management standards, including those used in the Maritimes). In Community Forests International's carbon offsets projects and for the NSFITT-funded Family Forest Network project we focus on inventorying above- and below-ground **tree biomass**. This is because it's one of the largest carbon pools, the most widely included carbon pool in forest offsets standards, and it's both cost-effective and efficient to measure. Other carbon pools may become eligible and desirable to inventory in the future, once efficient and cost-effective sampling methods are developed – but nobody is there yet.

The science of managing forests for increased carbon holding capacity, and resilience to disturbance is very new. Gathering data in forest stands will help inform future managers and decision-makers about optimizing durable forest carbon storage in the Wabanaki forest region. Finding overlap between managing carbon and other



indicators like biodiversity and stand complexity is likely to become increasingly valuable to future forest stewards and society.

## **II. Selling offsets or claiming climate benefit from protecting / managing forests**

No matter whether you are inventorying forest carbon to sell as offsets, or if you are doing so to make a claim about the climate benefit of your forest, you are only legitimately allowed to make claims to the **additional** carbon in your woodlot. Basically, you only get rewarded for storing more carbon than the status-quo – this status-quo or “business-as-usual” scenario represents the **baseline** of carbon stocks<sup>1</sup>. Knowing this baseline allows for comparisons of your project’s likely impacts with what would otherwise have occurred under “business-as-usual” management. Similarly, a **Common Practice Scenario**<sup>2</sup> (often a requirement of registered offsets projects) describes the most common or widespread forest management practices that occur in the region of the project area. Forest carbon models are used to determine how much carbon is stored in this type of forest, which becomes the baseline of carbon storage. For the Maritimes, Community Forests International calculated that a conservative baseline is 50 tonnes of C per hectare<sup>3</sup>.

Essentially, you aren’t able to be credited for doing the same as the baseline – authentic climate benefit only occurs from additional carbon that is stored above the baseline. In the case of carbon offsets, not all of the carbon stored under a project qualifies for sale as a carbon offset – only the carbon stored over and above the baseline counts as a carbon offset. This ensures that the carbon offset credits sold are truly above and beyond what is most common within the region in question. Offsets or other climate benefits are not expressed in terms of elemental carbon, though – they are expressed in relation to GHGs, and so expressed typically as **tonnes of carbon dioxide equivalent** (t CO<sub>2</sub>e).

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<sup>1</sup> For a more detailed but still accessible explanation of these concepts, see: Community Forests International. 2019. Climate forests: growing rural prosperity in the Canadian Maritimes through forest carbon offsetting.

<sup>2</sup> de Graaf, M. 2017. Private Land Forestry in Canada’s Maritime Provinces: A Common Practice Scenario. Community Forests International.

<sup>3</sup> We plan to revisit this baseline and update it in the coming year, so it may change.





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In addition to being able to demonstrate additionality, a carbon project must also demonstrate **permanence** – you don't get to claim some climate benefit unless the carbon in question is quite stable and secure. In the case of forest carbon offsets projects, that means that you need to demonstrate that the carbon you have been contracted to sequester and store in your forest project is stable over the course of the project period, which is typically 40-100 years. Because natural systems like forests are dynamic, and vulnerable to natural disturbance events like fire, insect pests, and diseases, most carbon offsets projects require a **permanence buffer** built into each project. The permanence buffer (a.k.a. buffer pool) is essentially insurance for the carbon offset sales. Greenhouse gas (GHG) emissions reductions and removals can be “reversed” if the stored carbon associated with them is released (back) to the atmosphere, so standards typically identify some portion of each carbon projects offsets that must be set aside as insurance, and those offsets are “pooled” from many projects to cover reversals that might happen. There are two kinds of reversals: unavoidable reversal (such as by natural agents like fire, insects, and wind) and avoidable reversal (like land conversion and over-harvesting), and the amount of offsets set aside as a buffer through a given project depends on how risky the project is for either type of reversal.

Another major consideration for claiming climate benefit from forests is the issue of **leakage**. Leakage refers to the requirement that eligible projects must not result in increased GHG emissions caused by the shifting of harvesting activities from the project area to other forestlands. Basically, you need to prove a net benefit to the climate through the creation of your project – shifting harvesting activities from your forest to another forest produces no net reduction in emission or benefit to the climate.

Forest size is also a significant consideration for carbon projects - it's generally not feasible to build a forest carbon offsets project on less than approximately 10,000 acres, due to the costs of project development, validation, and ongoing third-party auditing (a.k.a. verification). Some registries and procedures include provisions for **aggregation** - creating a single project that includes the forests from several land owners (typically within the same jurisdiction, for legal reasons). This, of course, increases the complexity of carbon projects and few of these projects have been attempted in North America.



### **III. State of carbon markets in Canada**

#### **A. Federal GHG Offset Credit System**

The Federal Government created a framework for a nation-wide **compliance** (a.k.a. regulatory) market and associated standards (i.e. rules for participation) in 2018 and has been developing the legal structures for that system since then<sup>4</sup>. The Canadian Greenhouse Gas Offset Credit System Regulations were published in spring 2022, and only two standards (a.k.a protocols) have been published (on landfill methane capture and emissions reductions from refrigeration systems) so far. Several more standards are in development, including an Improved Forest Management (IFM) standard, which would govern forest carbon offsets projects. The probable timeline for publication of that standard is summer 2023, which means that forest carbon projects across Canada that meet all the criteria of the IFM standard could begin to be registered in 2023.

#### **B. New Brunswick and Nova Scotia**

At present, there are no compliance markets available to forest projects in Nova Scotia or New Brunswick. There are two projects developing that sell offsets into the **voluntary** market – that is, that sell either directly or through a broker to companies who wish to voluntarily offset their GHGs. The first is a project being developed by the NS Working Woodlands Trust (NSWWT) in partnership with Finite Carbon (a project developer) under the Air Resources Board’s *Methodology for the Quantification, Monitoring, Reporting and Verification of Greenhouse Gas Emissions Reductions and Removals from Improved Forest Management on Canadian Forestlands*<sup>5</sup>. Through this project, NSWWT is in the process of pulling together small private landowners across NS to form a single aggregated 10,000-acre project, through which offsets revenues will in part be used to place conservation easements on participating properties to protect them in perpetuity.

The second is a project being delivered by Community Forests International in partnership with the Natural Capital Exchange (NCX). Currently, this is in a pilot phase, with over 60 landowners in NB and NS being paid for harvest deferral credits (a

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<sup>4</sup> <https://www.canada.ca/en/environment-climate-change/services/climate-change/pricing-pollution-how-it-will-work/output-based-pricing-system/federal-greenhouse-gas-offset-system.html>

<sup>5</sup> <https://americancarbonregistry.org/carbon-accounting/standards-methodologies/improved-forest-management-ifm-on-canadian-forestlands>





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different form of carbon offsets) on ~65,000 acres of land. Somewhat different from more traditional carbon offsets projects, NCX's model pays landowners to defer harvesting of merchantable timber on some or all of their forest land for one year<sup>6</sup>, rather than commit to decades-long agreements.

More carbon offsets options and opportunities are undoubtedly coming to the region, including access to the Federal compliance market as described above. At present, there are no provincial carbon offsets registries (markets) or standards/protocols that are accessible to small private stewards for forest projects (improved forest management or otherwise).

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<sup>6</sup> <https://ncx.com/learning-hub/the-planet-needs-forest-carbon-2-0/>

