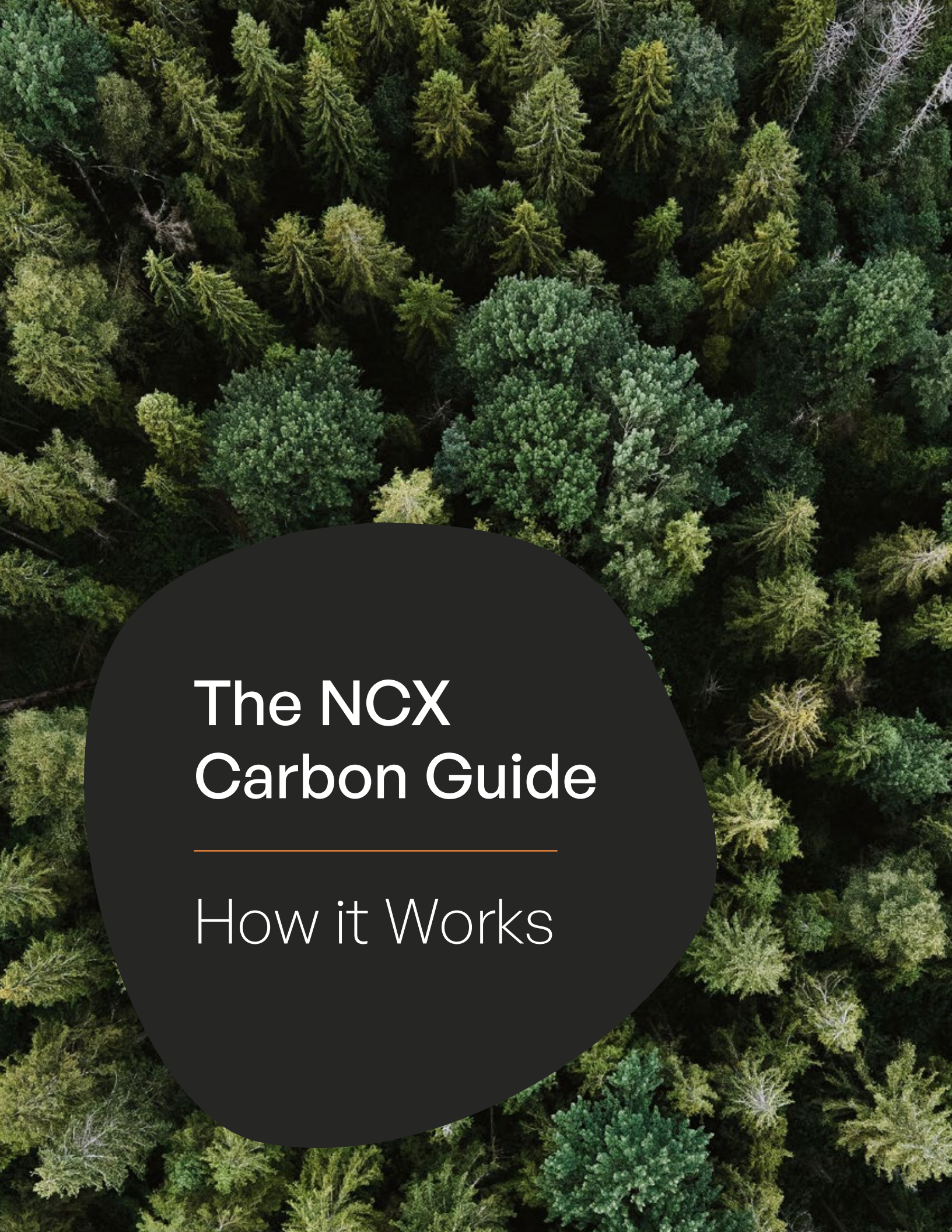

The NCX Carbon Guide

How it Works

The Problem We Seek to Solve:

The Climate Emergency

The 2020s are a critical decade for climate action: there is an urgent need for mitigation projects that can provide real and efficient impact. Forest carbon offsets hold tremendous potential, but traditional forest carbon projects have yet to engage a broad spectrum of landowners, falling short of the growing market demand.

NCX seeks to meet the climate challenge by delivering large-scale, near-term impact through a thoughtful, science-based carbon program that addresses the existing barriers preventing landowners from participating in the carbon market. Our goal is to enable widespread, equitable landowner participation and bring high quality carbon credits to market. These credits provide direct benefit to landowners, and give carbon buyers confidence that they're creating real climate impact.

What Makes NCX Different?

We bring credible science, cutting edge technology and an informed, practical knowledge of forestry and forest management to craft a program that addresses the key barriers to landowner participation in traditional carbon programs.

The NCX program pays forest landowners that are likely to harvest to defer some or all of those harvests for one year. In doing so, carbon is held longer on the landscape, preventing it from being released into the atmosphere and enabling an additional year of growth. In this way, a one year delay can actually have a significant climate impact, and the impact is magnified when many such one-year delays are packaged together into one carbon program.

TO LEARN MORE ABOUT THE BIG PICTURE OF NCX:

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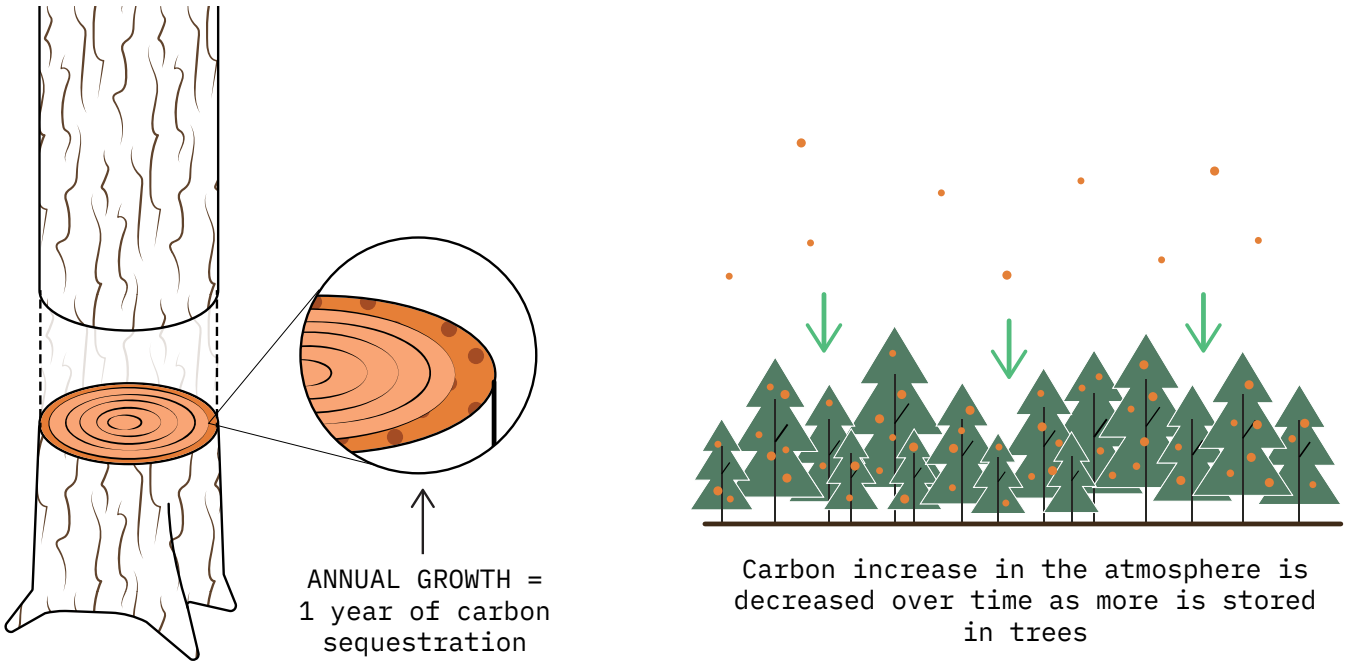
NCX's Framework for achieving real, immediate, scalable and efficient (RISE) climate action

Call to Action: Edward Norton and Zack Parisa

FIGURE 1: **Annual harvest deferral: What a difference a year makes**



Tackling the biggest barriers for landowners and carbon buyers.

NCX is focused on driving large-scale, near-term climate impact by addressing the barriers that have, thus far, prevented broadscale participation in carbon programming by landowners and buyers. Drawing on the best available science and cutting edge technological innovation, NCX seeks to enable a rigorous and practical carbon program that anyone can use. The approach is working, **as enrollment in NCX's program has increased rapidly to several thousand landowners across millions of acres**.

Here are the key barriers for landowners and how we have tackled them:

LONG PROJECT TERMS: Carbon offset programs generally have established minimum terms of 10 to 100 years. Unfortunately, most forest landowners are unwilling or unable to make the long-term commitments that many crediting programs require. According to a 2021 report from the US Forest Service, **fewer than 1% of American family landowners participate in carbon programming**. To engage a broad land base and drive greater impact, we need project terms that work for landowners. As a result, NCX is focused on short project terms that are a good fit for landowner behavior and preferences. Indeed, shorter project terms may foster long term landowner engagement. Shorter terms also reduce risks for carbon buyers, as discussed below.

MINIMUM ACREAGE: Most carbon crediting programs require a minimum acreage requirements and costs are often prohibitively high for even relatively large (up to 5,000 acres) landowners. Yet, the average family holding is much smaller than this and those owning fewer acres have experienced the greatest challenges. NCX has addressed this access issue by having no minimum (or maximum) acreage requirement.

UNCERTAINTY: One reason many landowners are unwilling to engage in carbon programs is uncertainty about timber markets in the future and when it might make sense to sell their wood. In addition, carbon pricing has historically been much lower than timber pricing. NCX has addressed these issues with a one-year harvest deferral that allows a landowner flexibility to engage in timber markets more fluidly. Likewise, the NCX platform uses a competitive bidding process, where landowners can review timber pricing and tell NCX "what it would take" to defer harvesting their timber for a year. This provides the landowners with much greater flexibility in deciding how and when to engage in forest carbon offset programs.

COMPLEXITY: Given the sophistication of carbon modeling and science, understanding carbon programs has long been a challenge for many audiences. With complicated procedures and language, as well as overlapping players (project developers, aggregators, verifiers, auditors, etc.), traditional carbon programs have been intimidating and difficult to understand. Investigating and evaluating options involves considerable upfront cost, time and effort that many landowners are unwilling or unable to invest. Most simply do not know where to start. NCX has developed an easy process, from sign up to payment, that comes at no cost to the landowner.

NEED FOR A MANAGEMENT PLAN: Traditionally, carbon programs have required plans. However, the National Woodland Owner Survey (NWOS) estimates only 5% of family landowners, who collectively own nearly 40% of forests in the US, have management plans. As such, most landowners would need to invest in developing a management plan to even get started with a traditional carbon program. NCX recognizes this challenge and uses its own technology and data to define likely harvest levels. NCX does not require a management plan for eligibility but does actively work with landowners to engage with foresters, develop plans if they'd like, and sustainably manage their lands.

TO LEARN MORE, SEE:

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Building Blocks: Baseline Model

Comparing Forest Carbon Program for Family Landowners

Unpacking the NCX Auction

FAQs for Landowners

Basemap Overview

In addition to lifting the specific barriers that landowners face, NCX has also developed strategies to credibly address the core technical critiques leveled at existing traditional carbon programs.

MEASURING BASELINE: Gauging the "baseline" conditions on a property before and after a carbon project is essential for credibly quantifying and selling or buying real

carbon credits. Unfortunately, carbon measurements have been complicated and expensive to ascertain with conventional measurements. NCX has leveraged deep experience in forest inventory and biometrics to integrate traditional on-the-ground inventories and methods with emerging technologies in order to address this measurement challenge. Combining modern remote sensing technology with widely available boots-on-the-ground inventories and cutting-edge machine learning, NCX is able to generate reliable estimates of forest composition, carbon, and timber value on an acre-by-acre basis. This comes at no cost to the landowner.

PAYING FOR BUSINESS AS USUAL (BAU): A critique of some carbon programs is that landowners may be getting paid for what they would have done anyway, which means there is no additional climate benefit or "additionality" to a carbon project. NCX's model uses data related to forest conditions, ownership information, and accessibility in a given geography to make acre-by-acre predictions of where harvest is most likely to occur under a "business as usual (BAU) scenario". Lands are weighted by their likelihood of harvest, based on these factors. As such, only forests that realistically would likely be harvested in the next year are eligible to participate, because deferral of a timber harvest represents a departure from BAU for that property.

These BAU assessments are made on a 0-100% likelihood basis, rather than the binary "harvest or no harvest" traditional carbon projects use. This allows us to work with more landowners to increase the scale of supply across the landscape, without compromising our rigorous standards for additionality.

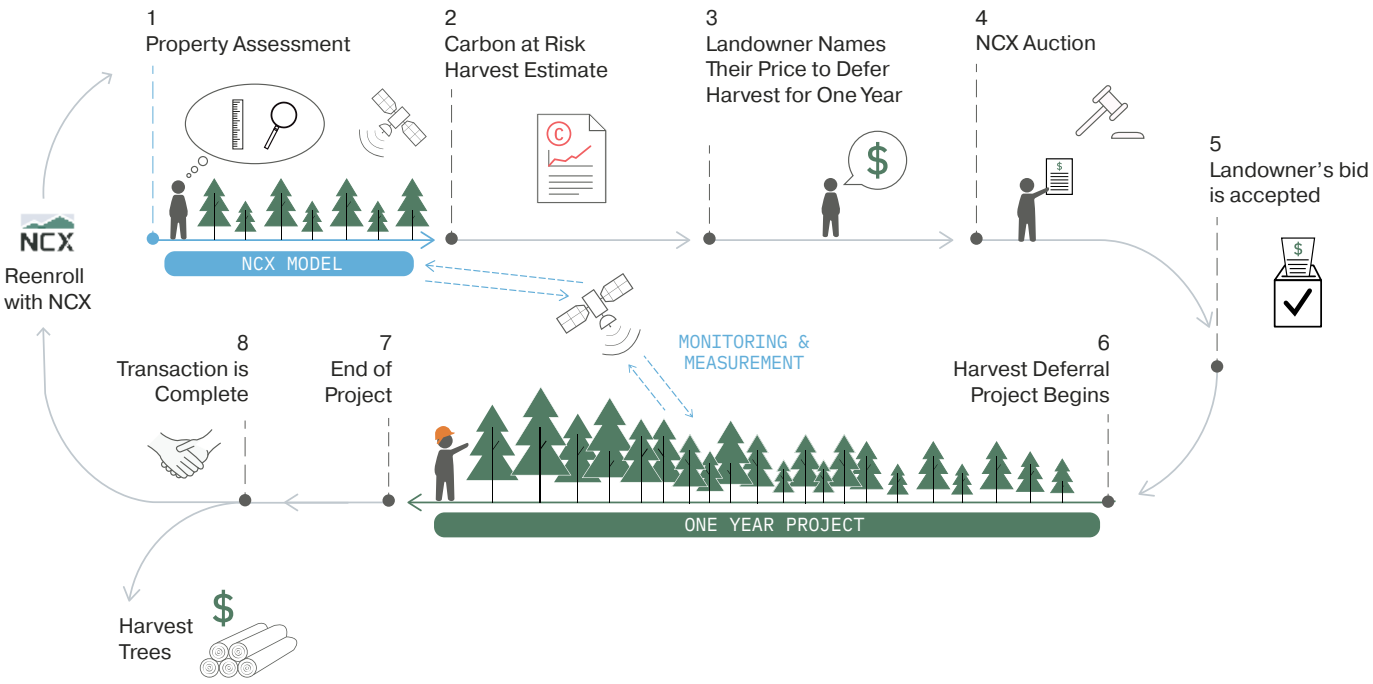
USING THE WRONG COMPARISON: Critics of carbon offset programs cite instances where generic, regional BAU baselines are used to evaluate additionality. In many cases, these baselines include plots from other forest ecosystems or types, making a given carbon project look like it resulted in more carbon sequestered than it actually did. NCX addresses this issue by generating acre-by-acre estimates for every property and tract enrolled, drawn from ground level inventories, remotely sensed data and robust models. This includes values for both timber and carbon, as well as social data. Further, baseline predictions of harvest probabilities use fine-grained local information to ensure that estimates are tailored to each property.

PROJECT COSTS: Traditional carbon programs have high setup costs, and require significant investment in insurance and/or credit buffer pools to guarantee permanence. Short project terms and fully delivered impact significantly reduces the cost of running a project.

How does the NCX Program work?

NCX's program is centered on a one-year harvest deferral cycle with each cycle representing the start and end of a new one-year project. Here is how it works.

FIGURE 2: A year in NCX's Carbon Program



PROPERTY ASSESSMENT: Interested landowners confidentially provide their property boundaries. Using on-the-ground inventories, remotely sensed data and information about the property's location, NCX's model evaluates the species and size of the trees, proximity to roads and markets, as well as other information such as typical management techniques to determine the likelihood of harvest of a given tract and how much carbon is "at risk" in that harvest. This forms a "business as usual" (BAU) scenario for that property, or a picture of what would happen if it was not enrolled in the NCX program.

Based on the estimated volume of carbon at risk associated with harvesting on the property, the report also identifies a total potential number of harvest deferral credits a landowner would receive if they opt to defer harvest for one year and pursue some or all of those credits.

LANDOWNERS NAME THEIR PRICE: With their property-specific assessment, landowners can make an informed decision about whether to move forward with a harvest or submit a bid in the NCX landowner auction to defer their harvest for one year and at what price. All the bids and bidders are anonymized so that there can be no bias in the process.

LANDOWNER AUCTION: NCX evaluates the anonymized bids. An auction "clearing price" is set. The clearing price provides a kind of matchmaking function, matching the buyers' demand for carbon credits and willingness to pay with the landowner sellers' available carbon credits at a price they are willing to sell them for. It is designed to maximize the total volume of carbon credits brought to the market, in order to meet buyers' demand. NCX uses a "uniform price auction" which means that any landowner who bids at or below the clearing price is paid that same price; this format of auction is both fair and straightforward for landowners, who don't need to focus on "bid strategy" but instead can focus on determining the price that makes the most sense for them.

HARVEST DEFERRAL: The landowners whose bids are accepted sign contracts with NCX, agreeing to forego harvest for the next full year.

MONITORING: In addition to the evaluation that all properties undergo prior to being accepted into the NCX program and a project beginning, NCX monitors whether or not the landowner follows through with their one-year deferral. NCX uses a stratified sampling design to evaluate properties enrolled in the program during the harvest deferral, as well as upon exit at the closure of the project term, including in-person inventories by foresters. All of this data flows back into the NCX computational model, promoting continuous improvement and accuracy over time.

PAYMENT + CARBON CREDIT: At the end of the one-year project period, deferred harvests generate tonne-years, which can be packaged into credits that each equate to 1 MTCO2e - just like any other carbon credit - that are sold to buyers, usually corporations, that want to offset the carbon emissions associated with their business operations. At the end of the year, the landowner is free to seek another assessment and bid to re-enroll with NCX, or move forward with their timber harvest.

TO LEARN MORE, SEE

Comparing Forest Carbon Program for Family Landowners

Unpacking the NCX Auction

FAQs for Landowners

Building Blocks: NCX Carbon Program

Structuring Your NCX Seller Agreement Bids

RE-ENROLLMENT: Landowners can choose to re-enroll at the end of the 1-year term. If they choose to re-enroll, they will begin the process over again with a new property assessment and bidding cycle.

NCX starts a new 1-year harvest deferral cycle with a new auction every three months, roughly aligning with the seasons. Landowners may also have the option to enroll in multi-year cycles, if they are interested.

Important Impacts and Aspects of the NCX Approach

Only one year? How does that affect the climate?

Once emitted, carbon stays in the atmosphere where it accumulates. Emissions to the atmosphere cannot be "undone." The more carbon emitted into the atmosphere, the warmer the temperature gets. As a result, the more emissions we can offset right now, **the better for the climate**. Even a delay of one year can have a real impact.

At its core, NCX's harvest deferral methodology translates short-term carbon storage into permanent climate impact (or a carbon credit that is the equivalent of a "permanent" 1 MT CO2e unit from a traditional offset project) using a scientific approach called tonne-year accounting.

A tonne-year is a time-specified unit of carbon dioxide equivalence. One tonne-year is defined as a metric tonne (MT) of carbon dioxide (CO2e) stored for one year.

Tonne-year accounting allows projects with shorter duration to accrue climate benefits and credits annually. The advantage of tonne-year accounting is that it allows sequestration projects to quantify temporary carbon storage on a permanent basis. It enables the quantification of the permanent and irreversible positive impact of one tonne of carbon stored for a year when a harvest is deferred.

In the case of a forest, a delay in harvest means not only that the emissions associated with the harvest are delayed but also that, during the year, the trees continue to grow and store carbon over the course of the harvest deferral year.

Because there is an urgent need to reduce or mitigate emissions now, even one year of delayed emissions associated with a harvest on a single property has an irreversible climate benefit. Tonne-year accounting allows for the specific quantification of the positive impact. If many properties do this, we can significantly increase our climate impact across a landscape.

What if a storm or fire destroys a forest?

Typically, forest carbon programs sell carbon credits at the beginning of a project which correspond to an obligation to maintain carbon storage well into the future. This presents risks though, because forests are vulnerable to unpredictable forces such as wildfire, insects, disease, and natural disasters like hurricanes and tornadoes. When a forest carbon project is subjected to these disturbances, the carbon that was intended to have been "permanently" stored might be emitted to the atmosphere, in an event known as a "reversal." To hedge against this risk, carbon offset programs often establish what is referred to as a "buffer pool" where a certain portion of credits are set aside, as replacements for any credits lost in a catastrophic event resulting in reversals over the course of a long project term.

There have been **critiques** of this approach and arguments that buffer pools may not be adequately stocked relative to the overall portfolio because too many credits were sold at a program level. Others point out that buffer pools make sense conceptually but cannot be guaranteed over the long-term, considering all the stressors forests face.

The NCX term is only one year, and, at the end of the year, the carbon sequestered in the harvest deferral is converted into carbon credits with permanent impact, using the tonne-year method, for sale to interested buyers. If a natural disaster impacts a forest during the harvest deferral year, credits are not generated by the project, as the additional carbon would not have been sequestered. Because the tonne-years are not created until the end of the one-year storage period, there is no risk to buyers of carbon value loss once the credits are delivered and, thus, no need for a buffer pool to guarantee credits to buyers following credit delivery. The climate benefit is realized and credited at the end of the year.

In a traditional project, credits are issued at the beginning of the project and the landowner is obligated to hold the carbon in the forest for the full project crediting period. Long-term monitoring might be undertaken to insure the carbon is maintained, and a buffer pool might be used to compensate buyers for reversals. In a tonne-year project, because the climate impact is credited after the participation period has concluded, there is no need for buffer pools or long-term monitoring for permanence.

How can NCX assess business as usual (BAU) carbon values on a property?

NCX's Basemap combines high resolution satellite imagery, climate and biogeography data, field measurements, expert knowledge of forest structure, and statistical modeling to assess forest composition and structure down to the 30m x 30m level. This enables the setting of a baseline of both timber and carbon values on an acre-by-acre basis without a site-level inventory.

Project level accounting includes field measurements on participating properties, which are used to refine the inventory estimates for each project at the beginning and end of the harvest deferral cycle. NCX programs are designed so that changes to the inventory and estimated baselines from the inclusion of field measurements do not impact landowners' experiences or payments. However the NCX harvest prediction and carbon estimation model is updated, as new data from the field, satellites and other data is refreshed.

TO LEARN MORE, SEE:

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Building Blocks: Measurement, Reporting, and Verification

Additionality: How do we know landowners were really going to harvest timber?

Additionality is a central tenet of all carbon offset programming. The basic concept is that any carbon sequestering activities would NOT occur without the financial incentives created by the carbon program. The climate benefits of these activities must be additional to what would have happened anyway, in the absence of the carbon program. Gauging additionality is challenging, however, because predicting what "would have happened" can be imperfect, especially when it is difficult or impossible to authenticate a landowner's intentions in various circumstances.

Concerns have been raised about carbon offset programs not truly offering additional climate benefits because landowners are paid to do what they would have done anyway. Similarly, the use of regional averages and long-term trends has led to **skewed estimates in business as usual** (BAU scenarios).

To address this and develop as objective as possible an estimate of what would have happened, NCX looks at what the specific property and local market would likely allow. Credits are then weighted based on their probability of harvest.

The NCX model estimates harvest probability based on property specifics including:

- species and age of trees, relative to likely harvest ages;
- ownership type (i.e., small family vs large industrial landowners)
- water and other features that impact operability
- potential products produced
- proximity to mills
- transportation infrastructure and haul distance
- overall cost to harvest
- local/regional timber pricing

FOR MORE DETAILS ON HOW WE ESTIMATE THE BASELINE, SEE OUR BUILDING BLOCK ARTICLES:

Building Blocks: Baseline Model

Building Blocks: Measurement, Reporting, and Verification

Instead of coarse regional averages, NCX uses acre-by-acre estimates based on specific data about each property. Similarly, because NCX has short project terms, market projections are updated annually to more accurately depict market conditions, instead of relying on long term projections. As such, a baseline model is constructed for each project and cycle, leveraging recent and locally specific information to understand where and how likely a landowner is to harvest.

What if a landowner harvests their forest right after the year-long harvest deferral?

In NCX projects, landowners are compensated for the climate impact associated with a one-year harvest deferral. At the end of the year, the climate benefit has already been realized through the delay of harvest. It cannot be undone; it is permanent. Therefore, a harvest that takes place after the conclusion of the harvest deferral period does not reverse the climate impact of the project. NCX's harvest prediction model identifies properties that have a high probability of harvest. As such, it makes sense that a harvest would happen soon after that landowner's enrollment in the NCX program concluded, if they choose not to seek renewal.

What role do foresters play?

Foresters are an important source of support and expert guidance for landowners. As such, they are also critical to the NCX Carbon Program. Often, foresters provide the linkage between a landowner and the market opportunities that help them not only to maximize the economic values on their property but

also to achieve their conservation goals - they are in a unique position to educate a landowner about the impacts and timing of harvest deferral. Foresters can become NCX affiliates, connecting landowners to the program and may receive compensation associated with harvest deferral payments.

TO LEARN MORE, SEE:

NCX Affiliate Program to learn more and apply for the program.

Has NCX's methodology been subject to third-party approval?

NCX is seeking the certification of its approach under the **Verified Carbon Standard (VCS)** program, a system of rules and requirements designed to ensure the credibility of carbon emissions reductions projects. The VCS program is administered by **Verra**, a nonprofit organization, that coordinates the certification process including technical assessment, third-party auditing and public consultation. Verra also provides a **carbon registry**, a central storehouse of data on all registered projects, and tracks the generation, retirement and cancellation of all verified carbon credits occurring through projects in certified programs.

In early 2021, NCX formally initiated its process toward certification of its program with submission of a *Concept Note* to Verra, outlining its methodology for improved forest management (IFM) using harvest deferrals. Verra accepted the Concept Note in May 2021, launching the process for certification. In late 2021, NCX submitted its methodology, following review by an external panel of experts.

A public consultation of NCX's methodology is underway.

Has NCX's approach to setting a baseline been reviewed by experts? What did they say?

Yes. NCX believes expert and stakeholder engagement are essential for scientifically validating the methodology and ensuring the broad landowner participation needed to drive the critical climate benefits at scale.

Following Verra's Methodology Requirements, in September and October 2021, NCX conducted an expert consultation to validate the performance benchmark metric used to calculate additionality and the crediting baseline.

Consistent with VCS Guidance, the panel was composed of recognized representatives of academia, industry, NGOs, and government, offering a diverse range of views, as well as specific knowledge and expertise relative to the methodology and performance benchmark metric.

The following experts engaged in the review:

Dr. Richard Birdsey, *Senior Scientist, Woodwell Climate Research Center.*

Dr. Brett Butler, *Director, USDA Forest Service National Woodland Owner Survey, USDA Forest Service, Northeastern Research Station, Forest Inventory and Analysis program.*

Dr. Charles Kerchner, *Forest Carbon Offset Service Area Lead, SIG Carbon.*

Dr. Greg Latta, *Assistant Research Professor of Forest Economics and Interim Director of Policy Analysis Group, University of Idaho.*

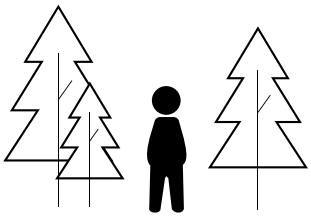
Dr. Steve Prisley, *Principal Research Scientist, The National Council for Air and Stream Improvement, Inc. (NCASI).*

Dr. Christopher Woodall, *USDA Forest Service, Northeastern Research Station, Forest Inventory and Analysis program (detailed to Washington Office at the time of this consultation).*

The consultation focused on a set of key questions relative to the Baseline Procedures. The experts were also provided access to the full draft of NCX's proposed Methodology for Improved Forest Management Through Targeted, Short-Term Harvest Deferrals and were encouraged to provide comments and feedback on the other components of the methodology, as an additional courtesy to NCX.

Overall, the expert panel provided support for the draft Baseline Procedures v1.0 and offered suggestions for clarification and considerations for further refinement. The experts recognized the distinctive approach, as well as novel applications applied in the Baseline Procedures and offered considerations to clarify and refine the broader Methodology. Experts noted that implementation would offer additional opportunity for insight and refinement over time.

Want to Engage with NCX?



If you are a landowner and want to start the process, **begin here**.

If you are interested in buying carbon, **learn more**.

If you have technical questions about the NCX process, **submit here**.