



NCX

Provider: NCX

Location: Current credits (December 2021 cycle to be delivered by June 2023) are offered from the majority of the lower-48 states in the United States.

Mechanism: Forestry

Website: <https://ncx.com/carbon-buyers>

Date evaluated: Mar-Apr 2021, Sept-Oct 2021

About

NCX connects buyers to high-quality forest carbon credits at scale through its Natural Capital Exchange. By combining satellite imagery, machine learning and field measurements, NCX measures every acre of U.S. forest every year to bring unprecedented transparency and accountability to forest carbon credits. Credits bought through the Natural Capital Exchange empower landowners big and small to participate in forest carbon markets while driving real climate impact, incentivizing the growth of older,

more carbon rich forests, supporting rural communities and advancing science-based measurements of both carbon and biodiversity impact.

All credits are underpinned by the following attributes:

1. **Transparency** - NCX is the only company that measures every acre of forest every year in the U.S. The depth and frequency of our forest measurement data provides an unparalleled level of transparency to both carbon buyers and forest owners.
2. **Quality** - Leveraging our expertise in forest management, we target acres that are actually at risk of being harvested, ensuring that carbon purchases create real change on the landscape.
3. **Scale** - By eliminating measurement and monitoring costs for landowners, NCX democratizes access to forest carbon markets so that every landowner and every acre of forest can be part of the climate solution.
4. **Impact** - Buyers can source carbon credits from large and small landowners in their community or in their supply chain. Share data-rich, geospatial stories about how your carbon purchases create real economic, social, and biodiversity impact.

Do you consider this project to be avoided emissions or emissions removed? Why?

We consider this project to be emissions removed because although we credit the harvest deferral, the result of our program is an increase in net removals across the landscape. Because U.S. forests are already a sink for carbon, reducing harvest serves to enhance their ability to grow more carbon-rich and leads to net removal on the landscape. IPCC includes enhancement of net carbon sinks in its definition of removals and our program does this. When NCX pays landowners to reduce their harvesting, it makes U.S. forests even more of a net carbon sink. More atmospheric CO₂ is removed than otherwise would have been, if the forest had been harvested. It's like U.S. forests are a vacuum sucking CO₂ out of the atmosphere—and NCX is "turning up the vacuum." This can also be considered in terms of the average forest age. When NCX pays landowners to reduce their harvesting, the average age of forests across the landscape increases, and therefore the average carbon density of those forests rises.

As support for this logic, NCX underwent a rigorous RFP process for Microsoft's 2021 carbon removal procurement including assessment from Carbon Direct, Microsoft, and others. Microsoft chose NCX as one of its top four carbon removal selections out of more than one hundred potential projects, ultimately procuring 200,000 MTCO₂e from us. See [pages 13 and 15 here](#) for our listed removal tons within Microsoft's FY21 portfolio. (Note: we recently changed our company name from "SilviaTerra" to "NCX").

What can you tell us about the carbon life cycle of the average tCO₂e that your solution removes or reduces?

We would need additional time to report on the carbon life cycle of the average tCO₂e.

Do you offer a direct-to-consumer purchasing option for your offsets?

NCX currently does not offer direct-to-consumer purchasing. We only sell B2B. We are excited to partner with channel partners such as Joro that connect our offsets directly to the consumer. Our minimum order quantity is 1,000 credits.

Are there any additional benefits that your company offers?

Customers who purchase NCX credits receive an [interactive dashboard](#) that, depending on the size of the carbon purchase, can be customized and tailored to the customer.

In addition to NCX's innovative, unique approach to carbon markets and forest carbon credits, NCX is built on over a decade of precision forestry. In conjunction with a credit purchase, we offer customers customized maps with locations of sourced credits overlaid with locations of customer offices, stores, supply chain hubs, etc. For example, if Joro provided data on where its users are located, we could show how the locations of our landowners overlap with Joro's users.

More broadly, NCX and CEO Zack Parisa are experts in the forest carbon community. Zack is a member of the [Taskforce for Scaling Voluntary Carbon Markets](#), which is focused on ensuring the voluntary carbon market scales with credible and transparent standards. NCX is a part of the [1t.org](#) U.S. Chapter and a member of the [Forest Climate Working Group](#) (a coalition focused on U.S. forests), and Zack and other NCX team members are expert advisors in using ton-year accounting to advance the voluntary carbon market scalability and quality. By purchasing credits from NCX, customers join this thought leadership community and have opportunities to take part in innovative discussions around ton-year accounting and forest carbon.

How much supply do you have still available for purchase in 2021?

Credits purchased from our upcoming Winter 2021 cycle in December would be delivered and eligible for retirement by June 2023. We expect to have hundreds of thousands of tons available to purchase from this Winter 2021 cycle. Joro can submit an order leading up the cycle to reserve a particular number of credits. There is a chance that additional credits may be available for purchase as surplus from Winter 2021, but no guarantee.

When does carbon reduction or removal occur? How is it distributed over time?

Carbon removal occurs immediately after the start of the landowner performance period. For our upcoming Winter Cycle, the performance period starts January 1, 2022 and ends December 30, 2022. Via remote sensing and field measurements, harvest deferral relative to the business as usual scenario is measured before and after the performance period to validate the actual, realized climate impact. Please see the Permanence section below for more information about the permanent climate impact.

NCX runs on quarterly cycles - each quarterly cycle creates a separate “project” that has its own measurements, validation, and verifications.

Integrity

First, projects must cross the hurdle of actually reducing or removing the carbon they claim to. To evaluate a provider's integrity, Joro considers verifiability, enforceability, additionality, permanence, and transparency.

Verifiability

How will you measure, report, and verify the emissions you are reducing or removing? What third party verifiers or other evaluators have evaluated this offset project? What verification standard or evaluation process did they use? If none, what plans do you have in place to get verified or evaluated?

NCX is currently pursuing Verra certification for its methodology titled “Methodology for IFM/ERA through Targeted, Short-Term Harvest Deferral.” NCX’s concept note was [accepted by Verra in February 2021](#) and we expect all NCX credits to be fully Verra certified by the time they are delivered.

Because of this, from the outset, NCX registers its Natural Capital Exchange projects as Verra projects, following the standard project documentation, validation, and verification steps in the expectation that Verified Carbon Units (VCUs) will be issued. NCX field measurements are third-party verified to ensure accuracy and reproducibility. This third-party verification will include re-sampling field measurements and reviewing our statistical estimates and calculations.

Verra is excited about our innovative approach to addressing challenges in forest carbon markets to date. In relation to our program, Verra provided the following statement: “Verra is excited about the potential of NCX’s methodology, in particular its incorporation of ton-year accounting and its use of remote sensing to improve measurements both for baselining and for project monitoring. We believe this approach has the potential to unlock greater supply, reduce monitoring costs, address issues of project reversibility, and increase transparency in forest carbon markets.”

Enforceability

Do you provide proof of retirement upon purchase of an offset?

At the end of the performance period and upon certification, credits will be transferred to Joro via the Verra registry. NCX is open to retiring credits on behalf of Joro if requested. Otherwise, once transferred, Joro has the ability to do as they wish with the credits - transfer, retire, hold, etc. NCX will provide documentation in accordance with Verra certified credits.

Additionality

Did the project require financial capital from offsets to make the project a reality?

Yes. This project would have not occurred in the absence of carbon credits generated via our project. NCX is working closely with Verra to validate the additionality of our credits under their revenue stream option, which disqualifies any acres that produce other sources of revenue beyond the revenue from NCX credits to participate in the project. NCX's BAU scenarios use a project specific crediting baseline to ensure additionality. This predictive model of harvesting activity considers the local economics of each acre of forest, a more targeted approach compared to traditional forest carbon projects. Please see [NCX's Brief on Additionality](#) for more information on our BAU and additionality calculations.

How will the project result in carbon reduction or removal that would not have otherwise happened without our purchase?

Under a business as usual (BAU) scenario, landowners enrolled in our program would harvest their trees. Instead, because of NCX's program, they will defer harvest for one year and sequester additional carbon in their forests. NCX's BAU calculation ensures that each credit represents real climate impact. In determining which landowners to accept into our program, NCX calculates these BAU scenarios using a property specific crediting baseline. This predictive model of harvesting activity considers the local economics of each acre of forest to ensure acre-level additionality. This is in contrast to traditional forest management projects, which often use a rough regional BAU estimate and have been the subject of criticism to date. Please see [NCX's Brief on Additionality](#) for more information on our BAU and additionality calculations.

Permanence

What is the duration in years over which the carbon storage or reduction represented by this project's offsets can be reasonably assured? What supporting research would you point to?

NCX's methodology quantifies the climate impact of extended rotation age in working forests and uses 1-year terms to increase the scale of participation among landowners and ensure each year, dollars are flowing to the most additional, cost-effective hectares on the landscape. The methodology enables 1-year terms through a **ton-year accounting** approach. A ton-year is a time-specified unit of carbon dioxide. One ton-year is defined as 1 metric ton (MT) CO₂ for a period of 1 year. Ton-years may refer to carbon residing in any carbon pool; they may refer to storage in a sink (i.e. 1 MT CO₂ stored in living tree biomass for a period of 1 year) or to atmospheric residence (i.e. 1 MT CO₂ residing in the atmosphere for a period of 1 year). NCX translates ton-years into equivalent permanent metric tons of carbon dioxide (MT CO₂e) removed for 100-years (the same carbon credit unit as traditional forest carbon projects) by using the IPCC's framework for quantifying the climate impact of each. Since ton-years can be procured from forest landowners for a

fraction of the price of conventional permanent tons, the resulting NCX carbon credits are price-competitive with other high-quality removal credits.

This ton-year accounting approach also reduces the need for a buffer pool or other delivery risk mitigation strategies. A buffer pool is required for a carbon project when credits are issued upfront for future carbon storage that may suffer reversals from wildfire or disease. In contrast, when an NCX project is completed after the one-year performance period, the additional carbon is fully credited and paid for and impact is complete. There are no going-forward costs or liabilities for any party and no potential for reversals of the activity that's been credited. At the time it's delivered, an NCX carbon credit constitutes the equivalent impact of 1 MTCO₂e or a "permanent ton."

Please see [NCX's Brief on Ton-Years and Permanence](#) for more information on this topic.

Regarding your question of supporting research, NCX is currently working on a scientific paper on ton-year accounting with climate scientists Eric Marland, Gregg Marland, and Brent Sohngen. Here are some other published papers on the topic:

[Metrics of Climate Change: Assessing Radiative Forcing and Emission Indices](#)

[IPCC Special Report on Land Use, Land-Use Change and Forestry](#)

[The Time Value of Carbon and Carbon Storage: Clarifying the terms and the policy implications of the debate](#)

[A Quantitative Approach to Evaluating the GWP Timescale Through Implicit Discount Rates](#)

Transparency

A carbon exchange is only as good as its data. NCX is the only company that measures every acre, of every property, every year, for every available value. Powered by Microsoft's AI for Earth, the Basemap forest map serves as the foundation of the Natural Capital Exchange (NCX). Basemap datasets provide acre-by-acre intelligence on the diameter and species of trees across the continental US. Our biometrists regularly update these datasets to assess habitat quality and harvest deferral strategies, on properties across the country, with unparalleled precision. The depth and frequency of our forest measurement data provides a unique level of transparency to both carbon buyers and forest owners.

Transformative Potential

Creating a just and sustainable future will require fundamentally transforming our society. We

prioritize carbon removal projects that contribute to a world for all life to thrive, considering efficiency, scalability, catalytic potential, ecosystem benefits, and community benefits.

Efficiency

What is the cost per carbon credit (tCO2e) for this project?

\$20/MTCO2e

Tell us more about your fee structure. Specifically, what percentage of an offset purchase goes towards your company, the project owner, and any other parties involved in the offset project?

NCX takes about 20% of the overall transaction price and the remainder goes to the landowner.

Scalability

Does this offset project represent a solution from Project Drawdown? If so, which one(s)?

NCX's solution represents improved forest management and in some cases forest protection (providing incentives to keep forests growing longer).

Can this solution theoretically be scaled up to reduce or remove at least X gigatons of carbon dioxide by 2050?

Yes. Forests have the potential to sequester and remove 7.3 gigatons of carbon from the atmosphere each year by 2050. Because our approach drives immediate climate impact, NCX is a key player to ensure we use forests as the world's largest natural carbon sink to meet the goals of the Paris Agreement by 2050.

Catalytic Potential

Does this project use a novel approach or a well-tested solution?

This is a novel approach that was formed through NCX's decade of experience in precision forestry.

Since 2010, NCX has helped forest managers use precision forestry tools to sustainably and profitably manage their forests. Based on technology developed at the Yale School of Forestry by NCX CEO Zack Parisa, the company worked with many of the largest government, commercial, and conservation-focused landowners in the United States. In collaboration with Microsoft's 'AI for Earth' program, NCX developed the first high-resolution forest inventory of the continental US, which we call Basemap. In addition, the US Forest Service had a sole-source contract with NCX and used our nationwide forest data for its pest and pathogen modeling.

In 2017, NCX began providing technical and methodological support for forest carbon project developers. The company assisted with the measurement, baselining, analysis, accounting, and verification for California Air Resources Board (CARB) forest carbon projects. Notably, NCX developed the first (and to our knowledge, the only) remote sensing method accepted by CARB for forest carbon baseline accounting. In this role, NCX performed a technical service known as "assessment area delineation and classification" for 22 forest carbon projects totalling over 20 million tons of carbon.

Through this CARB work, NCX realized that data could address challenges in traditional forest carbon projects to date related to quality and scale. This inspired NCX to transition from precision forestry to being the leader in generating transparent and verifiable forest carbon credits for the voluntary carbon market.

Does this project help demonstrate replicability and inspire similar future projects?

Yes! One of the main reasons we are excited about our "Methodology for IFM/ERA through Targeted, Short-Term Harvest Deferral." methodology is because once certified under Verra, any project developer can take our methodology and insights and apply it to his/her projects.

How does your project lead to greater innovation in the broader carbon removal field?

As mentioned above, in **2017** NCX developed the first (and to our knowledge, the only) remote sensing method accepted by CARB for forest carbon baseline accounting. Then, in **2019**, in collaboration with Microsoft's 'AI for Earth' program, NCX developed the first (and to our knowledge, only) high-resolution forest inventory of the continental US, which we call Basemap. **Now**, NCX is submitting, for the first time, a forests-based ton-year accounting methodology to Verra (ton-year accounting exists for agriculture under another standard) and once approved will be the first (and only) ton-year accounting forest carbon methodology in voluntary carbon markets. This ton-year accounting methodology could be applied not only to other forests but also to other forms of nature-based solutions. Nature-based solutions are dynamic, living ecosystems whose carbon sequestering capabilities will change as the world warms. Ton-year accounting ensures we drive impact at scale in this critical decade for the climate while accounting for the dynamic nature of ecosystems.

Risks: What are the primary risks to the success of this offset project?

1. Lack of data as we scale internationally: As NCX expands beyond the United States, data may not be as readily available in international geographies. NCX may have to bring in additional 3rd party datasets to supplement NCX data.

2. Voluntary carbon market policy hindering innovation: NCX is a new approach to forest carbon markets and has strategies and processes beyond traditional carbon markets. It is vital that policy allows for innovative projects that are an improvement on

traditional projects. This risk is mitigated by serving as an advisor to policy and private sector groups, such as the [Taskforce for Scaling Voluntary Carbon Markets](#) and [Forest Climate Working Group](#) mentioned above.

3. Delivery risk - that landowners will not end up delivering on their obligations:

Performance risk of landowners is mitigated by having a large, diversified set of landowners, which means they are less correlated with respect to unintentional non-delivery (e.g. hurricanes) and also with respect to intentional non-delivery (e.g. they are in different markets, so even if timber prices go way up in 1 location, all of our landowners won't rush out and harvest all their timber). If we were just sourcing from 1 landowner or 1 region, the risk from both of these effects would be higher. Additionally, NCX ensures that we source a sufficient amount of carbon to account for any delivery risk and still be able to deliver on our obligations.

Ecosystem Benefits

Does this offset project address any [Sustainable Development Goals](#) beyond Climate Action? If so, which three is your solution most closely aligned with?

Yes - in addition to SDG 13, the Natural Capital Exchange addresses SDG 14 and SDG 8/11.

Ecosystem protection:

In line with SDG 14, sustainable forest management is the ultimate aim of and underpins NCX's program. NCX aims to give society a lever to drive sustainable forest management and ecosystem protection at scale. For example, in addition to driving outcomes for forest carbon, NCX quantifies wildlife species habitat quality. Unlike traditional forest carbon projects that do this in a qualitative way, our scientists provide quantitative metrics about the impact of investments in forest carbon wildlife co-benefits. Our 2021 Spring cycle measured habitat quality of two bird species and the white-tailed deer, and our 2021 Summer cycle added measurements for the Canada lynx and Snowshoe hare.

Social equity and justice:

In line with SDG 8 and SDG 11, NCX's program provides an economic alternative for landowners who have traditionally been excluded from carbon markets, creating an inclusive market and an alternative source of income for millions of families across rural communities. NCX empowers these communities to be paid to sustainably manage their forests for more than just the timber. NCX's one-year terms do not lock landowners into multi-generational contracts - creating the flexibility to manage forests as needed to maintain resilient and sustainable ecosystems while not encumbering future generations with contracts designed decades ago.

Are these co-benefits tracked and/or measured? If so, how?

Our vision for the Natural Capital Exchange is to measure and value all the co benefits provided by forests, beyond carbon and timber. We are actively working to quantitatively measure and validate wildlife and biodiversity co-benefits and may ultimately credit wildlife or biodiversity credits to enable customers to pay directly for biodiversity outcomes on the landscape. We are starting with our habitat quantification via the [Impact Dashboard](#) - the White-Tailed Deer metrics, for example, were developed in consort with Mississippi State University deer lab.

Our next step is further engagement with conservation NGOs that model habitat for species in the areas we are sourcing credits from. We are actively working on this roadmap, and it is likely a habitat/biodiversity certification pilot will be co-sponsored by a NGO or conservation group.

Community Benefits

Who are your community stakeholders? How are local communities involved or consulted in this project?

Community landowners are at the core of NCX's ethos, approach, and marketplace. We designed NCX from the ground-up to work for landowners ranging from the smallest to the largest. NCX empowers communities across the U.S. to participate in forest carbon markets and be paid to sustainably manage their forests for more than just the timber. NCX's one-year terms do not lock landowners into multi-generational contracts - creating the flexibility to manage forests as needed to maintain resilient and sustainable ecosystems.

Our U.S. origination team actively engages landowners of all sizes through one on one conversations, landowner associations, trusted advisors (in the form of consulting foresters) and more to enroll landowners on the platform and solicit their feedback on the development of our program.

What potential risks do these communities face directly or indirectly related to your work? What steps have you taken to address these risks?

There's a widely-acknowledged risk that the transition to a low-carbon economy will be led by the segments of society that already benefit disproportionately from advances and investments in innovation and technology, leaving behind the rest. Equitable and inclusive forest carbon markets cut squarely against this risk, aligning rural communities with conservation and climate progress, and allowing them to share in the value created by climate regulation 'technologies' broadly defined, which have always included natural climate solutions.

In particular, small- and medium-size forest landowners have been almost entirely excluded from forest carbon markets, relegating over 200 million productive US forest acres to the climate sideline. By dramatically reducing transaction costs and reducing the carbon contract length to 1 year, NCX opens market participation to this entire segment, giving them access to carbon payments on equal terms with larger institutional landowners. In addition to diversifying small landowner income streams and offering payments for previously unrecognized value, annual carbon markets like NCX also de-risk family asset ownership by distributing return realization across many years, instead of concentrating it in infrequent, one-off harvesting events. This helps keep forests as forests and contributes to the economic base of rural communities. Through economic engagement, these communities can participate more constructively in the climate conversation and help develop climate solutions.

Additionally, NCX is committed to evaluating trade-offs in forest carbon programs and directing project development to minimize these trade-offs or address them directly. For example, wildfire risk in the western U.S. requires more active ecological thinning - reducing carbon in forests in the short-term in opposition to the goals of forest carbon projects. We aim to engage landowners not only in forest carbon projects but also in wildfire risk reduction efforts to ensure we are not inadvertently increasing wildfire risk in forests in the west.

What non-carbon benefits from this project accrue to local communities?

As described above, the NCX model itself is built to safeguard the environment and local communities. In contrast with other projects that may only care about carbon, NCX aims to use its remote sensing technology and data to value all forest benefits and is therefore well-suited to mitigate the risks of unintended consequences of paying for carbon that affect both the physical environment and local communities. For example, NCX is using its remote sensing data to not only measure carbon impact, but to also generate impact metrics for wildlife habitat quality. This allows us to better understand the impact of investments in forest carbon on biodiversity.

What are the land use implications on local communities as a result of your projects?

Local communities across the U.S. that would have harvested their forests will be incentivized to grow their forests longer and more carbon rich, increasing the average age of forests across the landscape and increasing the amount of forest cover overall. This will lead to follow-on benefits such as increased habitat or higher habitat quality for particular species.

Images

Additional photos, shared by the provider





