

Voluntary Forest Carbon Markets and Programs for Mississippi Landowners

Given the currently struggling timber market, many landowners have become interested in alternative sources of income from their forests. Forest carbon markets are an option that pays landowners for the carbon sequestered and stored within their forests. However, due to concerns about issues such as the longevity of carbon storage, most of the current markets use longer contracts, such as 20 to 40 years, to satisfy carbon registry standards.

Landowners considering enrollment are advised to make sure they fully understand the terms of the contract, limitations of future forest management, and passing of property to their heirs. Beyond that, landowners should make sure they understand pricing, how and when revenues will be received, carbon baselines, and taxes on revenues (likely taxed at ordinary income rates). They should also understand how market and political changes may impact the longevity of the market or agency they are dealing with.

The Carbon Story

Atmospheric carbon dioxide (CO₂) levels are rising and have been attributed to increases in emissions of greenhouse gases (GHGs) from fossil fuels and land use change. Climate model predictions indicate rises in temperature and sea levels and shifts in climate in the form of more intense and frequent droughts, floods, and catastrophic storms.

Forests are a critical tool for reducing atmospheric CO₂ levels and climate impacts. Growing trees sequester CO₂ from the atmosphere through photosynthesis, which converts that CO₂ into carbon stored in the wood, roots, and leaves. Currently, the U.S. Forest Service estimates that forests in the United States capture approximately 16 percent of GHG emissions.

Further, to have a market, there must be a measurable, quantifiable, verifiable, and trackable commodity. Carbon sequestered and ultimately stored by forests checks all of these boxes.

Carbon Markets

Carbon markets can be voluntary or involuntary. Voluntary carbon markets provide a means for companies or individuals to purchase carbon credits merely to offset GHG emissions. An involuntary (or compliance) carbon market is a mandated or regulated market where companies must purchase carbon credits to offset their emissions beyond a specified GHG emission (the cap). Sometimes, involuntary carbon markets are referred to as cap-and-trade markets.

This publication presents information on voluntary carbon markets. Table 1 highlights the diversity of voluntary forest carbon markets that are rapidly evolving in the United States. Many options are currently available in terms of attributes. With time, more programs may become available, and characteristics of programs will change.

Some of these markets pay directly for the carbon stored in existing forests, while others are indirect, including payments for management practices and reforestation, afforestation, or establishment costs for converting non-forested land into forested land. Some markets trade credits using both direct and indirect carbon sequestration processes. One of the common methods is deferring harvest to keep carbon stored longer in the trees.

Currently, there are five general types of forest projects accepted for producing carbon credits:

- Afforestation/Reforestation (R)
 - Restores tree cover to non-forested land.
 - Often involves high costs due to planting, seeding, or use of acorns.
- Avoided conversion (AC)
 - Prevents conversion of forest to non-forest.
 - Must demonstrate forest is at significant risk of conversion.

- Improved forest management (IFM)
 - Involves management activities to maintain or increase current carbon stocking levels, often in relation to geographical/regional common practices.
 - Includes examples such as increasing rotation age, competition control, thinning treatments, and improved stocking levels.
- Select cut above baseline or some other threshold
 - Usually, after some amount of time, yields above a baseline, where the baseline is often determined at the time of enrollment, can be harvested and sold by the landowner.
 - It is crucial that an accurate baseline is calculated and that increases above the baseline are accurately calculated to optimize financial returns.
- Deferred harvest (DH)
 - Defers harvest, resulting in an additional amount of carbon on the landscape for a limited time.
 - It is vital for a program to accurately conclude that a particular forest could be harvested at the current time if the landowner wished.

Following are some important concepts related to forest carbon markets.

Additionality

Additionality is an important concept of forest carbon markets. Carbon sequestered and ultimately stored must be additional, beyond some baseline resulting from business-as-usual (BAU) practices, for a carbon offset to effectively and meaningfully offset GHG emissions. Additionality is the sequestration and storage of carbon resulting directly from a practice conducted because a landowner enrolled in a carbon project to receive compensation for that additional amount of carbon sequestered and stored on the landscape.

Business-as-Usual (BAU) and a Carbon Baseline

A closely related concept is business-as-usual (BAU), which is essentially forest management practices that a particular landowner would conduct if that landowner did not enroll in a forest carbon project. **All forests sequester and store carbon, regardless of whether those forests are enrolled in forest carbon offset projects.**

Thus, under BAU, a landowner's forest will still sequester and store carbon; this is their baseline amount of carbon sequestered and stored. When a landowner fails to enroll in a forest carbon offset project, thereby managing their forest

consistent with their BAU, there is no incentive to conduct a practice leading to more carbon being sequestered and stored beyond this baseline amount (i.e., additionality).

Permanence

For carbon offsets and projects, the word *permanence* has a specific meaning. Permanence relates to how long the CO₂ removed or avoided will be kept out of the atmosphere. When we evaluate credits based on permanence, we refer to the degree of confidence we have that a particular project will keep the carbon out of the atmosphere for a given period of time and its actual long-term impact.

Permanence highlights the importance of sustained climate action, distinguishing between temporary benefits and those contributing meaningfully to long-term climate change mitigation (at least in theory). For carbon credits to be meaningful, they must guarantee that the GHG reductions or removals they represent are sustained over time and that the impacts are not temporary.

Thus, for the concept of permanence, we need to think beyond our own lifetimes. The best carbon offset projects assure that the carbon they sequester or avoid will remain out of the atmosphere for at least 100 years. Often, 100 years is considered the benchmark for a project to claim itself as permanent and is used as a reference length. This benchmark explains to a large degree the need for the now-common longer contract lengths of 40 to 100 years. For example, carbon dioxide equivalents (CO₂e) denote the amount of CO₂ that would have the same climate impact over a specified time horizon for other GHGs.

Buffers and reversals come into play for events, such as wildfires or beetle infestations, that release the carbon back into the atmosphere before fulfilling the contract length (e.g., a wildfire occurring in year 16 of a 40-year contract). Reversals are when carbon promised to be sequestered and stored actually is not because of unforeseen factors, often natural but sometimes human (e.g., inadvertent harvesting). Essentially, then, a buffer is when some of the carbon that could be sold by a landowner is set aside as insurance to ensure that if any reversals do occur, the market can still deliver to the buyer the promised amount of sequestered and stored carbon. Thus, a buffer acts as a safety net and ensures the integrity of previously issued credits.

Registries and verifiers play a vital role in both voluntary and involuntary carbon markets to ensure that carbon offsets being sold and purchased are valid and permanent based on an accepted definition and that periodic audits are conducted throughout the life of a project. Because of issues

related to permanence, often the longer the contract, the higher the price per carbon “credit” or “offset.”

Leakage/Nonleakage

Leakage is when GHG reduction in one location causes an unattended increase in GHG emissions in another location. For instance, let us assume a landowner has two 50-acre properties that should be partially harvested under an uneven-aged management regime; they are similar in forested conditions, road infrastructure, and growth rates, and thus, the BAU baseline is the same for both properties. The landowner decides to enroll one of the 50-acre properties in a deferred harvest forest carbon project, thereby currently foregoing timber harvest revenues but receiving revenues for the carbon sequestered and stored. To compensate for the lost timber harvest revenues, they decide to clearcut the other 50 acres. This is an example of leakage—clearcutting the other 50 acres essentially nullifies the long-term impact of the deferred-harvest acres.

Leakage can potentially reduce the overall carbon offset and reductions that the landowner can claim. Thus, the landowner will sell fewer carbon credits than they anticipated, and this should reduce their revenue from the project. This is why many forest carbon markets ask you to enroll, or at least disclose, your entire land ownership.

Carbon Offset Projects, Registries, and Verifiers

The basic concepts of additionality and BAU are fundamental to all carbon offset projects, sometimes referred to as carbon markets or programs. However, due to registries and verification, projects that result in additional amounts of carbon being sequestered on the landscape differ in defined practices.

As mentioned previously, project additionality can be achieved through these practices:

- Reforestation or afforestation
- Avoided conversion (AC)
- Improved forest management (IFM)
- Select cut above baseline or some other threshold
- Harvest deferral/deferment (NCX was 1 year; others are 5, 20, or more years.)

The parties involved in the voluntary carbon market include the landowner, project developer, registries, verifier, and

buyer. Landowners interested in participating in the voluntary carbon market will decide which developer’s project they want to follow. Project developers create and source carbon offset projects, working with registries and verifiers to meet required standards, thereby making the project certified for purchase by consumers (buyers) to offset their carbon footprint.

The role of registries is to provide a set of standards for carbon projects, including carbon measurement and methodology, and to review and regulate the project to ensure that it is certified. The role of verifiers is to inspect a carbon program and ensure it meets the set standards. A third party does the verification. Both sellers and buyers seek registry-verified carbon credits. These verified credits are particularly important for voluntary carbon markets and projects.

Other factors that make credits more attractive and valuable include whether a project meets Sustainable Development Goals (SDGs) set by the United Nations, has biodiversity certifications, or meets robust Integrity Council for the Voluntary Carbon Market (ICVCM) standards. These projects are in high demand and will likely continue to be in the foreseeable future.

Expected Revenue Per Acre

Potential carbon credit income can be a deciding factor in whether a carbon program is right for your forest. There are many factors that can impact expected revenue per acre:

- Type of trees in your forest
- Site productivity/growth rates
- Regional timber markets (as part of BAU assessments and baseline calculations)
- Harvesting constraints
- Current condition of the forest (stocking, size, species, etc.)
- Methodology requirements
- Contract length (related to permanence)
- Potential income tax concerns

There are various pricing regimes. Some programs and projects offer annual payments, while others compensate landowners by using a fixed offset price for a certain period, after which payments are tied to current offset market prices. For many programs and projects, the flexibility to conduct management practices, particularly harvests, increases with time.

Table 1. Attributes of different voluntary forest carbon market programs currently in the United States. *The summarizations below are to the best of our knowledge at the current time; please verify for yourself.*

Program	Contract length	Minimum acreage	Is harvesting allowed?
Family Forest Carbon (AL, not MS and OK currently)	20–30 years	30 acres	Yes, with restrictions; projects differ. Focused on naturally occurring hardwoods and planting loblolly.
LandYield CORE Carbon (Finite Carbon)	40 years (two 20-year periods)	40 acres; no more than 5,000 acres	No, during initial 20 years. Yes, with restrictions second 20 years. Plantations and natural.
Anew	40–100+ years; depends on choice of voluntary or compliance market	4,000 acres (need not be contiguous)	Yes, with restrictions. For improved forest management (IFM), projects cannot exceed forest growth.
Forest Carbon Works	25-year annual payment period; up to 50 years. Then either 35- or 100-year monitoring period.	100 acres	Yes, with restrictions.
Green Trees	40 years; can extend for another 40 years	5 acres	Yes, with restrictions; focused on afforestation and hardwoods. They have a potential IFM project for existing timberland.
NativState	40 years	50 acres	Depends on selected option.
GreenAssets	Varies	Depends on choice of voluntary or compliance market.	Project-specific.
Living Carbon (PA, WV, OH, VA, TN, KY, NC)	Typically 30–40 years	300 acres (need not be contiguous)	Likely not during contract period; focused on afforestation; abandoned or degraded agricultural land using mixed-species plantings.
Carbon Rho (AR, LA, OK, TX)	Up to 55 years	Project-specific.	Yes, with restrictions; reforestation project of Red River.
EcoRestore	Varies	Depends on choice of voluntary or compliance market.	Project-specific.
Sky Harvest	Landowner chooses length, with a minimum of 5 years	“Small acreage”	Deferred harvests given your desired length of commitment, with minimum of 5 years of harvest deferral.

Note: NCX no longer operates its own forest carbon program. However, they help landowners to identify potential investment opportunities.

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