

# Carbon Sequestration



# A Message from Alabama's State Forester

There is no doubt that here in Alabama and across the nation, market forces are creating changes in how we view traditional forest product markets. The major changes are being driven by the emerging biomass energy and carbon sequestration markets.

Energy costs are escalating, almost on a daily basis, and any real or perceived negative impact to supply results in quick and often, significant price increases. There is a frenzy of activity to find alternative energy sources to replace or reduce the consumption of oil. One such alternative is woody biomass. Another is the emerging Carbon Sequestration market.

Carbon sequestration refers to the provision of long-term storage of carbon in forests, soils, underground, and oceans. One of the best and most efficient sequesters of carbon is our forests. Everyone knows that in the process of photosynthesis, plants take in lots of carbon dioxide from the air. Once inside the leaves, carbon becomes the building block of the plant tissue and is stored (sequestered) above and below ground.

After many years of discussion, the establishment of a market to increase carbon sequestration is slowly emerging here in the United States. Currently, this market is strictly voluntary and is driven by companies who want to “go green” to enhance their public image. Companies will purchase “credits” (a defined amount of sequestered carbon) to offset their carbon emissions. Because the carbon market is emerging and voluntary, there are several reasons that forest landowners should proceed cautiously who have carbon credits to sell.

First, most everyone knows that demand and supply generally establishes price. Demand is intermittent and supply is unknown at this time. Hence, price can be very volatile. Secondly, in many areas, protocols have not been established that will ensure sellers' interests are protected by clearly laying out what is expected and required of the landowner, aggregators, and verifiers. Most small landowners have questions about how the whole process works such as, “Will planned forest management activities need to be changed? How much will I receive for my carbon tons if there is legislation requiring a company to purchase sequestered carbon tons versus a voluntary approach? etc.”

The Alabama Forestry Commission (AFC) believes the Carbon Sequestration market has the potential to provide landowners another opportunity to increase their forest investment financial return. At the same time, like any new market, it's important that sellers take the time to educate themselves about the market and what steps they need to take to ensure their interests are protected. As long as the market is voluntary, there is ample time for landowners to go slow and learn as much about this new market as they can. In the next few weeks, the AFC will be providing additional information on our website at [www.forestry.alabama.gov](http://www.forestry.alabama.gov). Additionally, if you have a specific question or concern, please contact an AFC representative in your county.

Linda Casey  
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## Why is it important to store Carbon?

The amount of carbon dioxide (CO<sub>2</sub>) in the air had been relatively constant for ten thousand years until the Industrial Revolution in the 1800s. Since then, the world's population has grown tremendously, as has the use of coal, oil, and natural gas.



Because CO<sub>2</sub> is a primary product of combustion, the atmospheric concentration of CO<sub>2</sub> has been on the rise. At the same time, average temperatures throughout much of the world have inched up and other climatic changes have been documented, indicating a connection between our use of fossil fuels and climatic effects.

Although total implications are not known, the majority of the scientific community feels strongly that continued unchecked growth of CO<sub>2</sub> releases into the atmosphere will have very negative effects on our environment. To effectively reduce CO<sub>2</sub> emissions, we must find alternative clean sources of energy as well as encourage the development of “carbon sinks” where atmospheric carbon is removed from the air and stored such that it will not negatively affect our environment.





## What is Carbon Sequestration?

The removal of carbon from the atmosphere is the process of carbon sequestration. This can be accomplished by storing atmospheric carbon into the ground, water, or into vegetation.

## How do trees play a role in Carbon Sequestration?

Trees take in CO<sub>2</sub> from the air in the process called photosynthesis. The tree effectively breaks down the CO<sub>2</sub>, stores the carbon in all parts of the tree, and releases the oxygen back into the atmosphere. Fast growing trees are, in fact, the most efficient way to sequester atmospheric carbon.

## What are Carbon Credits and how are they determined?

A “carbon credit” is a market term. Carbon storage in trees is usually measured in carbon dioxide equivalent (CO<sub>2</sub>e). Trees are roughly 50% carbon, based on dry weight. A carbon credit is equal to one metric ton of CO<sub>2</sub>e. Therefore, the amount of carbon credits on your property can be computed based on a forest inventory cruise of your property to determine the timber volume by weight. Some factors that will affect the amount of carbon sequestered in your forest will be the age of the trees, stocking levels, species, and site index of the soil.

## What things should I consider before signing up? How do I decide if I should participate?

The carbon market has been established in the U.S. but it is in its infancy. There are still many unknowns. Forest landowners should be able to benefit from the increased interest in carbon trading either through direct sequestration or revenue sharing with power generation facilities. The decision to participate in the carbon market will be heavily influenced by factors such as the commitment period required, associated fees, market access, inventory methods, and silvicultural treatments.

Only after careful consideration and consultation with professionals experienced in this subject matter, should a decision to participate be made. You should also fully consider how your short- and long-term management objectives will be impacted from participating.

## Who buys Carbon Credits?

Currently in the U.S., the Chicago Climate Exchange (CCX) is the only recognized commodity based trading market for carbon credits. The commodity traded on the CCX is a Carbon Financial Instrument (CFI) contract which represents 100 metric tons of CO<sub>2</sub>e. Smaller landowners do not sequester enough carbon on their land to meet this minimum requirement. Therefore, they must sell through an aggregator.

## How do I choose an Aggregator?

The entire process of finding and signing up forest carbon stocks has taken on a “land rush” mentality. Since the markets are still being developed, every landowner wanting to explore selling their carbon offsets should always remember, “SELLER BEWARE.”

If you are looking for an aggregator, or an aggregator contacts you, first and foremost make sure they are registered with the CCX. If they are not, STOP! Do not pass “Go” because you could be entering into a legally-binding agreement with someone who has no access to an operating carbon exchange in the U.S.

Once you have verified that you are working with an actual approved aggregator, then read the contract carefully and make sure you feel comfortable with the aggregator. Ask about carbon pool amounts, verification fees, and aggregator fees.

## What is the value of a Carbon Credit?

Because this market is voluntary, the value of a carbon credit remains relatively low. If congress passes cap and trade legislation requiring reduced emissions, the value of a carbon credit is expected to increase significantly.

## What are the requirements? Is there a minimum land ownership requirement?

- A forest landowner must manage his forest under a certified sustainable forest program and sign a commitment form to do so for the length of the contract.
- Approved certification systems include Forest Stewardship Council (FSC), American Tree Farm Systems (ATFS), the Sustain-



able Forest Initiative (SFI), and any other CCX-approved certification system. Most landowners in Alabama can accomplish this by being certified as an American Tree Farm.

- The American Tree Farm system requires that you own at least 10 acres, have accomplishments in sustainable forest management, be inspected by a registered forester, and are recommended for certification.
- Further, the amount of credit and contract length will be determined by the type of forest project, and therefore the way carbon is being stored. Those types are:

**Afforestation** is the planting of new forests on lands which have not contained forests. Landowners are eligible for the Afforestation program if they planted trees after January 1, 1990, on land that did not previously have trees. Under Afforestation, the landowner cannot thin or harvest trees on enrolled land.

**Managed Forest Projects** are sustainably managed forests such that their growth in carbon stocks exceeds their harvest. Landowners are eligible for the Sustainably Managed Forest program if they follow a certified forest management program. Thinning and harvesting is allowed under the Sustainably Managed Forest, but the landowner must have a net increase of the carbon stored or will be out of compliance with the XFO contract.

**Long-Lived Wood** is harvested wood that has existed for a long period of time and served as a carbon sink.

## Glossary of Carbon Market terms

**Additionality:** The quantity of carbon offsets issued to an individual property enrolled in program, based on the net annual increase in stored carbon (expressed in metric tons of CO<sub>2</sub> equivalence), over and above the property's initial baseline inventory.

**Afforestation:** Planting trees on land that was previously used for crops or pasture.

**Aggregator:** A market-authorized trader that can sell carbon credits.

**Aggregation Fee:** Fee charged by aggregator and deducted from each enrollee's payment received from the sale of carbon credits.

**Carbon Credit:** A market term for one metric ton of carbon dioxide equivalent (CO<sub>2</sub>e); also known as Forest Exchange Offset (XFO).

**Chicago Climate Exchange (CCX):** North America's global marketplace for integrating voluntary legally-binding emissions reductions with emissions trading and offsets for all six greenhouse gases.

**CCX Transaction Fee:** Fee charged by CCX and deducted from each enrollee's payment received from the sale of carbon offsets through the CCX Trading Platform.

**Certification:** An evaluation provided by a nationally-recognized, natural resources-affiliated organization that confirms forests are managed sustainably on a long-term basis and not converted to other, competing uses.

**Cap & Trade:** Is an administrative approach used to control pollution by providing economic incentives for achieving reductions in the emissions of pollutants. It is sometimes called Emissions Trading.

**Forest Carbon Baseline:** The quantity of carbon (expressed in metric tons CO<sub>2</sub> equivalent) stored on an individual property at the time it has completed all requirements necessary for enrollment.

**Forest Service Provider:** A registered forester that assists a forest landowner with selling carbon credits.

**Inventory:** Quantitative method used to estimate the actual volume, composition, and market value of standing timber.

**Managed Forests:** Forested land harvested in accordance with an approved forest stewardship plan, forest certification, and a current forest inventory.

**Pooled Projects:** The total quantity of individual properties an aggregator represents.

**Verifier:** A technical expert, approved by market or registry, who verifies the amount of carbon offsets an aggregator calculates is present on an individual property.



For more information, contact your local Alabama Forestry Commission office or visit our website at [www.forestry.alabama.gov](http://www.forestry.alabama.gov)

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