

# Carbon Sequestration

**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 Sustainable 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.

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## Water Quality Services

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Landowners can also form groups that can help to link buyers and sellers together.

There is no doubt that water quality trading programs are superior to the traditional command-and-control and fee systems. Expected cost-savings in trading is the main reason for pursuing nutrient trading. The market for water quality has a strong theoretical basis and has received significant political support in the United States in recent years. However, it cannot be a sole substitute for water quality regulations. Given the huge forest base of Alabama and the excellent water quality services that forests can provide, forest landowners possess an extraordinary potential to play a major role in water quality trading. But, a water quality trading program may not be successful without a cooperative action by landowners, the government, NGOs, and the regulated parties. Organizations such as Westervelt Ecological Services (WES), the Alabama Land Trust, Inc., and the Land Trust of Huntsville & North Alabama have been actively involved in the preservation of this state's natural resources. They perhaps can play yet another important role in the task of providing clean water to Alabama by working together with landowners and government agencies. ♻️

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## Carbon Sequestration

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### 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 register 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)