

## Key Words and Phrases for Forest Owners Interested in Forest Carbon Markets

The following key words and phrases are designed to support self-directed exploration of carbon payment programs for family forest owners.

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### Forest Carbon Dynamics

<b>Term</b>	<b>Definition</b>	<b>Related FOCCE articles</b>
Forest carbon	Carbon-based sugar molecules (i.e., glucose and cellulose).	<a href="#"><u>What Do Forest Carbon “Sequestration” and “Storage” Mean?</u></a>
Carbon sequestration	The creation of glucose in a plant through the process of photosynthesis.	<a href="#"><u>What Do Forest Carbon “Sequestration” and “Storage” Mean?</u></a>
Carbon storage	The building of plant structures by converting glucose into cellulose, and lignin.	<a href="#"><u>What Do Forest Carbon “Sequestration” and “Storage” Mean?</u></a>
Woody biomass	The trunks, limbs, tops, needles, leaves, and all other woody parts, grown in a forest.	<a href="#"><u>Methods for Estimating Carbon Within Forests</u></a>
Forest carbon pools	Forest carbon tends to accumulate into five different pools: aboveground biomass, belowground biomass, dead wood, forest floor litter, soils. Harvested wood products, and solid waste are carbon pools found in human settings.	<a href="#"><u>Forest Carbon Pools: Where are they?</u></a>
Forest carbon gains and losses	The amount of carbon that enters and exits a forest due to a number of processes including photosynthesis, respiration, decomposition, combustion, and harvesting. (i.e., carbon dynamics)	<a href="#"><u>Carbon Accounting in Forest Management</u></a>  <a href="#"><u>Forest Carbon Pools: Where are they?</u></a>
Carbon sink	When a system (e.g., a forest) absorbs more carbon from the atmosphere than is released.	<a href="#"><u>How to Manage Forests for Carbon</u></a>

Carbon stocks	A system that has the capacity to store or release carbon.	<a href="#"><u>Forest Carbon Pools: Where are they?</u></a> <a href="#"><u>The Economic Value of Private Forests and Climate Change Mitigation</u></a>
Dry wood weight	The weight of wood when it is dried in a kiln to a moisture content of 10%. About half of the dry weight of wood is carbon.	<a href="#"><u>Conversions Commonly Used When Comparing Timber and Carbon Values</u></a>

### Forest Carbon Management and Contracts

Climate-smart forestry practices	A wide variety of practices that aim to prepare all kinds of forests to adapt to and/or mitigate climate change and support ecosystem services and cultural values.	<a href="#"><u>How to Manage Forests for Carbon</u></a>
Improved forest management	Specific practices that help increase carbon stocks within forests and/or reduce greenhouse gas emissions from forestry activities (compared to business as usual practices)	<a href="#"><u>How to Manage Forests for Carbon</u></a>
Forest carbon payment programs	Programs implemented by project developers to broker deals with landowners so their land can be included in a nature-based carbon offset project.	<a href="#"><u>The Economic Value of Private Forests and Climate Change Mitigation</u></a>
Forest carbon contract	Legal arrangements between a project developer and the landowner detailing which management obligations are required by the landowner, the amount of carbon the project developer will purchase, and the level of payment provided to the landowner. The project developer generally sells the carbon credits generated by the owner to a buyer as a separate activity.	<a href="#"><u>What should I think about before signing a forest carbon contract?</u></a>
Delay harvest scheme	Owners are paid to intentionally delay timber harvesting or extend harvest rotations to increase overall carbon sequestered by a forest. Typically applied to working timberlands.	<a href="#"><u>How to Manage Forests for Carbon</u></a> <a href="#"><u>Carbon Accounting in Forest Management</u></a>

Reforestation	When new trees are planted in locations where forests absent or in decline.	<a href="#"><u>How to Manage Forests for Carbon</u></a>
Risk of harvest	The likelihood that a stand will be harvested in the foreseeable future. Risk is often based on tree species, trunk diameter and distance to forest products manufactures.	<a href="#"><u>How to Manage Forests for Carbon</u></a>
Accidental release	When a natural disturbance (e.g., wildfire, hurricane, pests) causes a large number of unexpected tree deaths, which increases carbon emissions from the forest via conditions that are deemed “unavoidable”.	<a href="#"><u>What should I think about before signing a forest carbon contract?</u></a>  <a href="#"><u>Questions to Ask Before Joining a Carbon Program</u></a>
Intentional release	When more harvesting occurs than is allowable by the legal forest carbon contract within the designated area and during a given period of time. This action increases the expected carbon emissions from the forest via activities that are deemed “avoidable”.	<a href="#"><u>What should I think about before signing a forest carbon contract?</u></a>  <a href="#"><u>Questions to Ask Before Joining a Carbon Program</u></a>
Carbon credit	A guarantee made by the offset project developer that the impact of one ton of CO <sub>2</sub> e emissions will be offset for 100 years. Buyers use these credits to offset the impact of their emissions and reduce their total carbon footprint.	<a href="#"><u>What should I think about before signing a forest carbon contract?</u></a>
Harvest deferral credits	A guarantee made by the forest owner that a certain amount of CO <sub>2</sub> e emissions will be prevented from entering the atmosphere for a short period of time (e.g., one year) by delaying harvest. The project developer then aggregates HDCs across properties to create a conventional carbon credit that can be sold.	<a href="#"><u>What should I think about before signing a forest carbon contract?</u></a>  <a href="#"><u>Conversions Commonly Used When Comparing Timber and Carbon Values</u></a>
Land expectation value	The expected value of a tract of land used for growing timber or carbon (including management costs).	<a href="#"><u>Long-Term Financial Planning for Timber and Carbon</u></a>
Time value of money	The idea that a dollar earned in the future is worth less than a dollar earned today.	<a href="#"><u>Long-Term Financial Planning for Timber and Carbon</u></a>

Opportunity costs	The value of an alternative outcome that is lost when taking a specific action.	<u>How much should I be paid for forest carbon?</u> <u>Long-Term Financial Planning for Timber and Carbon</u>
Discount rate	A rate representing the reduced value of money that is only available in the future. Most forest projects use a 4% discount rate.	<u>Long-Term Financial Planning for Timber and Carbon</u>
Net Present Value	The current value of a future stream of payments from a company, project, or investment.	<u>Long-Term Financial Planning for Timber and Carbon</u>
Cutting Cycle	Frequency that individual trees are selected and harvested over a period of time.	<u>Long-Term Financial Planning for Timber and Carbon</u>
Annual rate of carbon sequestration	The average amount of carbon sequestered per unit area per year. Rates are often used to make predictions to inform investments.	<u>Carbon Accounting in Forest Management</u>

### Climate Change Dynamics

Climate change	Shifts in global temperatures and weather patterns over centuries.	<u>Climate Regulation and Change: What is Causing it?</u>
Weather	The current state of the atmosphere, ranging from a few minutes to weeks.	<u>Climate Regulation and Change: What is Causing it?</u>
Global warming	Rapid increase in global temperatures due to elevated levels of carbon dioxide and other greenhouse gas (GHGs) emissions in the atmosphere.	<u>Climate Regulation and Change: What is Causing it?</u>
Greenhouse Gases (GHGs)	Gases in the earth's atmosphere that trap heat like a blanket. Carbon dioxide is a major GHG.	<u>Climate Regulation and Change: What is Causing it?</u>
CO <sub>2</sub> e emissions	CO <sub>2</sub> stands for "Carbon dioxide". The letter "e" stands for equivalent greenhouse gases.	<u>Climate Regulation and Change: What is Causing it?</u>
Biological drivers of climate regulation	Living organisms take in and release carbon molecules through the processes of photosynthesis, respiration, decomposition, and combustion.	<u>Forest Carbon Pools: Where are they?</u>

Forests and CO <sub>2</sub> emissions	When 1 unit of forest carbon (cellulose) decomposes, it turns into 3.667 units of carbon dioxide emissions (CO <sub>2</sub> ).	<u>Conversions Commonly Used When Comparing Timber and Carbon Values</u>
Human drivers of climate change	The release of carbon dioxide and other greenhouse gases through the combustion of fossil fuels and other anthropogenic processes to support energy production, transportation, agriculture and development.	<u>Climate Regulation and Change: What is Causing it?</u>
Factors that affect how people experience climate change	Latitude, elevation, mountains, and large water bodies influence the circulation of warm and cold air masses across the earth's surface.	<u>Climate Regulation and Change: What is Causing it?</u>

**Carbon Market Actors (People)**

Carbon offset project developers	Individuals and organizations that generate plans for carbon offset projects in specific locations in order to generate carbon credits that can be sold.	
Carbon offset project investors	Corporations and financial institutions seeking a return on investment from funding carbon offset projects that generate carbon credits for sale.	
Standard-setting bodies or offset programs	Independent organizations that develop protocols, or approved project methodologies	
Carbon offset registry	Standard-setting bodies have carbon offset registries that serve as publicly available platforms for reporting and tracking project documents, credits, ownership, sale, and retirement of credits.	
Carbon offset project managers	Individuals who oversee the development and implementation of a specific carbon offset project.	
Carbon offset project representatives	Individuals who help carry out procedures in data management, forestry, and marketing related to a carbon offset project. They may be employees or independent consultants.	

Carbon offset project partners	Governmental and non-governmental organizations that help developers implement projects and programs in regions of interest.	
Private landowners	Private landowners may enroll in a program that allows project developers to track the generation of carbon credits on their land and broker the sale of carbon credits.	
Buyers of carbon offsets credits	<p>1. Corporations and organizations who are voluntarily looking to reduce their carbon footprint, often motivating by a desire to improve their environmental, social, and corporate governance (ESG) ratings by meeting their own reduced emissions goals.</p> <p>2. Businesses in emissions-capped sectors (per government regulation) whose emissions exceed their determined allowable emissions.</p> <p>3. Credits may also be bought by Individuals who are concerned about climate change and want to reduce their carbon footprint.</p>	

**Carbon Market Mechanisms**

Climate change mitigation activities	Actions that limit climate change by reducing emissions of greenhouse gases (GHGs)	
Carbon dioxide (CO <sub>2</sub> ) and air pollutants	CO <sub>2</sub> is the primary greenhouse gas that affects the Earth's climate. Currently, CO <sub>2</sub> is, not considered an air pollutant under federal laws. It is considered a pollutant under some state laws that regulate emissions.	
Carbon offset project	A project constituting verified activities that aim to help reduce, remove, or avoid greenhouse gas emissions relative to a baseline, or business as usual, behavior. Nature-based carbon offset projects often	

	involve private forest lands or the establishment of forests on non-forested land.	
Carbon credits	<p>A guarantee made by the offset project developer that the impact of one ton of CO<sub>2</sub>e emissions will be offset for 100 years.</p> <p>In other words, a tradeable certificate representing a verified reduction in net carbon emissions or additional carbon sequestration. Credits can be exchanged on voluntary or compliance carbon markets, where they may be considered synonymous with carbon offsets accounting for excess emissions.</p>	<u>Conversions Commonly Used When Comparing Timber and Carbon Values</u>
Metric ton	1 metric ton (mt) is equal to 1.10231 US tons (t). Carbon credit units are in metric tons.	<u>Conversions Commonly Used When Comparing Timber and Carbon Values</u>
Carbon offset protocols	A set of approved program rules and requirements for measuring, monitoring, reporting, and verifying additional carbon sequestration and storage. in order to generate carbon credits. Rules must meet a certain set of industry approved standards (see below).	
Standard of “additionality”	<p>Project developers must provide evidence that the climate mitigation benefits provided by the project are new and would not have happened otherwise except for the project.</p> <p>More specifically, greenhouse gas removals or reductions should be additional to what would otherwise occur in ‘baseline’, business-as-usual (BAU), or ‘non-project’ scenario. The BAU could be the common management practices for that forest.</p>	<u>How to Manage Forests for Carbon</u>
Baselines and additionality	In order to determine how much carbon is “additional”, project managers have to predict or estimate	<u>How to Manage Forests for Carbon</u>

	<p>how much carbon would have been stored and sequestered under a business-as-usual scenario, (i.e., without the intervention). These projected emissions constitute baseline carbon values.</p> <p>Additional net carbon sequestration is the difference between the real, measured emissions relative to the projected baseline value.</p>	<p><u>Carbon Accounting in Forest Management</u></p>
<p>Standard of “Permanence”</p>	<p>Project developers must defend that the carbon stored by their program/project, and the resulting credits generated, will provide long-term carbon benefits, similar to the fossil fuels never having been extracted in the first place.</p> <p>For nature-based projects, this means that total carbon gains must exceed carbon losses over the lifetime of the project, where the lifetime of the project (often 100 years <i>beyond</i> a project’s credit-generation period).</p>	<p><u>Carbon Accounting in Forest Management</u></p>
<p>Standard of “Non-Leakage”</p>	<p>Project developers must defend that their additional carbon storage has not led to such additional carbon losses outside the project area, (i.e., that their projects will not be “canceled out” due to shifts in activity elsewhere).</p> <p>Leakage refers to a measurable increase in GHG emissions outside of the project area as a result of emission-related activities being limited within the project area. For example, leakage occurs when a project activity (e.g., delayed harvest) reduces the production of a commodity and, in doing so, causes an increase in activity (e.g., harvest) elsewhere in order to meet continuing market demand.</p>	<p><u>Carbon Accounting in Forest Management</u></p>



Carbon offset market	Trading systems where carbon credits are bought and sold.	
Voluntary Market	Project developers sell carbon credits directly to buyers or through a broker (i.e., an unregulated market). Almost all offset projects that include family forests are sold on the voluntary market.	
California Cap and Trade Market	A regulated marketplace that facilitates the exchange of carbon credits between project developers and corporate buyers. The California Cap and Trade program is designed to reduce the emissions of 450 businesses in California who are responsible for around 85% of California GHG emissions. Offset projects that include family forests are <u>not</u> typically sold on this market.	
Social cost of CO <sub>2</sub> e	The expected economic impact (e.g., including jobs, human health, infrastructure damage) of allowing additional CO <sub>2</sub> e to be emitted to the atmosphere. The social cost of not mitigating climate change, set by the Biden administration, is \$51 per metric ton CO <sub>2</sub> e.	<u><a href="#">The Economic Value of Private Forests and Climate Change Mitigation</a></u>