

## Terms and Concepts Associated with Forest Carbon Management on Private Forestlands

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Term	Definition	Extension article for more information
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="#">What Should I Think about Before Signing a Forest Carbon Contract?</a>  <a href="#">Questions to Ask Before Joining a Carbon Program</a>
Annual rate of carbon sequestration	The average amount of carbon sequestered per unit area per year. Rates are often used to make predictions about the volume of carbon storage over time to inform investments.	<a href="#">Carbon Accounting in Forest Management</a>
Biological drivers of climate regulation	Living organisms take in and release carbon molecules through the processes of photosynthesis, respiration, decomposition, and combustion.	<a href="#">Forest Carbon Pools: Where Are They?</a>  <a href="#">How Forests Store Carbon</a>
Buyers of carbon offsets credits	<p>1. Corporations and organizations that are voluntarily looking to reduce their carbon footprint, often motivated by a desire to improve their 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. Individuals who are concerned about climate change and want to reduce their carbon footprint.</p>	<a href="#">Forest Carbon Market Structures and Mechanisms</a>  <a href="#">How a Forest Carbon Offset is Made and Sold</a>
California- Quebec Carbon Market, a	A compliance market or regulated marketplace that	<a href="#">Forest Carbon Market Structures and Mechanisms</a>

<p>Cap-and-Trade Program</p>	<p>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 that are responsible for around 85% of California GHG emissions. Offset projects that include family forests are <i>not</i> typically sold on this market.</p>	<p><a href="#">How a Forest Carbon Offset is Made and Sold</a></p>
<p>Carbon credit</p>	<p>A permit that allows a business or organization to produce GHG emissions because they are paying someone else to reduce emissions (e.g., owners of forestlands). "</p> <p>A guarantee made by the offset project developer that the impact of 1 ton of CO<sub>2</sub>e emissions will be offset for 100 years.</p> <p>A tradable 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>	<p><a href="#">Forest Carbon Market Structures and Mechanisms</a></p> <p><a href="#">How a Forest Carbon Offset is Made and Sold</a></p>
<p>Carbon dioxide (CO<sub>2</sub>) and air pollutants</p>	<p>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.</p>	<p><a href="#">Forest Carbon Market Structures and Mechanisms</a></p>

Carbon offset market	Trading systems through which carbon credits are bought and sold.	<a href="#">Forest Carbon Market Structures and Mechanisms</a>  <a href="#">How a Forest Carbon Offset is Made and Sold</a>
Carbon offset project	A land based project formed around 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 forestlands or the establishment of forests on non-forested land.	<a href="#">Forest Carbon Market Structures and Mechanisms</a>  <a href="#">How a Forest Carbon Offset is Made and Sold</a>
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.	<a href="#">Forest Carbon Market Structures and Mechanisms</a>  <a href="#">How a Forest Carbon Offset is Made and Sold</a>
Carbon offset project investors	Corporations and financial institutions seeking a return on investment from funding carbon offset projects that generate carbon credits for sale.	<a href="#">Forest Carbon Market Structures and Mechanisms</a>  <a href="#">How a Forest Carbon Offset is Made and Sold</a>
Carbon offset project managers	Individuals who oversee the development and implementation of a specific carbon offset project.	<a href="#">Forest Carbon Market Structures and Mechanisms</a>  <a href="#">How a Forest Carbon Offset is Made and Sold</a>
Carbon offset project partners	Governmental and nongovernmental organizations that help developers implement projects and programs in regions of interest.	<a href="#">Forest Carbon Market Structures and Mechanisms</a>  <a href="#">How a Forest Carbon Offset is Made and Sold</a>
Carbon offset project representatives	Individuals who help carry out procedures in data management, forestry, and marketing related to a carbon	<a href="#">Forest Carbon Market Structures and Mechanisms</a>

	offset project. They may be employees or independent consultants.	<a href="#">How a Forest Carbon Offset is Made and Sold</a>
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).	<a href="#">Forest Carbon Market Structures and Mechanisms</a> <a href="#">How a Forest Carbon Offset is Made and Sold</a>
Carbon offset registry	Standard-setting bodies use carbon offset registries to serve as publicly available platforms for reporting and tracking project documents, credits, ownership, sale, and retirement of credits.	<a href="#">Forest Carbon Market Structures and Mechanisms</a> <a href="#">How a Forest Carbon Offset is Made and Sold</a>
Carbon sequestration	The creation of glucose in a plant through the process of photosynthesis.	<a href="#">What Do Forest Carbon “Sequestration” and “Storage” Mean?_</a>
Carbon sink	When a system (e.g., a forest) absorbs more carbon from the atmosphere than is released.	<a href="#">How to Manage Forests for Carbon</a>
Carbon stock	A system that has the capacity to store or release carbon. Forests are considered a living system that stores and release carbon.	<a href="#">Forest Carbon Pools: Where Are They?</a> <a href="#">The Economic Value of Private Forests and Climate Change Mitigation</a>
Carbon storage	The building of plant structures by converting glucose into cellulose and lignin.	<a href="#">What Do Forest Carbon “Sequestration” and “Storage” Mean?_</a>
Climate change	Shifts in global temperatures and weather patterns over decades and centuries.	<a href="#">Climate Regulation and Change: What Is Causing it?</a>
Climate change mitigation activities	Actions that limit climate change by reducing emissions of greenhouse gases (GHGs).	<a href="#">Forest Carbon Market Structures and Mechanisms</a>

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="#">How to Manage Forests for Carbon</a>
CO <sub>2</sub> e emissions	CO <sub>2</sub> stands for “carbon dioxide.” The letter “e” stands for equivalent greenhouse gases.	<a href="#">Climate Regulation and Change: What is Causing it?</a>
Conventional carbon credit	A guarantee made by the project developer that 1 ton of CO <sub>2</sub> e emissions will be offset for 100 years.	<a href="#">How a Forest Carbon Offset is Made and Sold</a>
Cutting cycle	Frequency with which individual trees are selected and harvested over a period of time.	<a href="#">Long-Term Financial Planning for Timber and Carbon</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="#">How to Manage Forests for Carbon</a> <a href="#">Carbon Accounting in Forest Management</a>
Discount rate	A rate representing the reduced value of money that is available only in the future. Most forest projects use a 3% discount rate.	<a href="#">Long-Term Financial Planning for Timber and Carbon</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="#">Conversions Commonly Used When Comparing Timber and Carbon Values</a>
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.	<a href="#">Climate Regulation and Change: What is Causing it?</a>
Forest carbon	Carbon-based sugar molecules (e.g., glucose, cellulose).	<a href="#">What Do Forest Carbon “Sequestration” and “Storage” Mean?</a>
Forest carbon contract	Legal arrangements between a project developer and the landowner detailing which management obligations are required by the landowner, the	<a href="#">What Should I Think about Before Signing a Forest Carbon Contract?</a>

	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's forest) to a buyer as a separate activity.	
Forest carbon gains and losses	The amount of carbon that enters and exits a forest due to various processes, including photosynthesis, respiration, decomposition, combustion, and harvesting (i.e., carbon dynamics).	<a href="#">Carbon Accounting in Forest Management</a> <a href="#">Forest Carbon Pools: Where are they?</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="#">The Economic Value of Private Forests and Climate Change Mitigation</a>
Forest carbon pools	Forest carbon tends to accumulate into five different pools: aboveground biomass, belowground biomass, dead wood, forest floor litter, and soils. Harvested wood products and solid waste are carbon pools found in human settings.	<a href="#">Forest Carbon Pools: Where Are They?</a>
Forests and CO <sub>2</sub> emissions	When 1 unit of forest carbon (cellulose) decomposes, it turns into 3.6667 units of carbon dioxide emissions.	<a href="#">Conversions Commonly Used When Comparing Timber and Carbon Values</a>
Global warming	Rapid increase in global temperatures due to elevated levels of CO <sub>2</sub> and other greenhouse gas (GHGs) emissions in the atmosphere.	<a href="#">Climate Regulation and Change: What is Causing it?</a>
Greenhouse gases (GHGs)	Gases in the earth's atmosphere that trap heat like a blanket. Carbon dioxide is a major GHG.	<a href="#">Climate Regulation and Change: What is Causing it?</a>

Human drivers of climate change	The release of CO <sub>2</sub> and other greenhouse gases through the combustion of fossil fuels and other anthropogenic processes to support energy production, transportation, agriculture, and development.	<a href="#">Climate Regulation and Change: What is Causing it?</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="#">How to Manage Forests for Carbon</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. This action increases the expected carbon emissions from the forest via activities that are deemed “avoidable.”	<a href="#">What Should I Think about Before Signing a Forest Carbon Contract?</a> <a href="#">Questions to Ask Before Joining a Carbon Program</a>
Land expectation value	The expected value of a tract of land used for growing timber or carbon (including management costs).	<a href="#">Long-Term Financial Planning for Timber and Carbon</a>
Metric ton	1 metric ton (mt) is equal to 1.10231 U.S. tons (t). Carbon credit units are metric tons.	<a href="#">Conversions Commonly Used When Comparing Timber and Carbon Values</a>
Net present value	The current value of a future stream of payments from a company, project, or investment.	<a href="#">Long-Term Financial Planning for Timber and Carbon</a>
Opportunity cost	The value of an alternative outcome that is lost when taking a specific action.	<a href="#">How Much Should I Be Paid for Forest Carbon?</a> <a href="#">Long-Term Financial Planning for Timber and Carbon</a>
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.	

Reforestation	When new trees are planted in locations where forests are absent or in decline.	<a href="#">How to Manage Forests for Carbon</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 mills and forest products manufacturers.	<a href="#">How to Manage Forests for Carbon</a>
Social cost of CO <sub>2e</sub>	The expected economic impact (e.g., including jobs, human health, infrastructure damage) of allowing additional CO <sub>2e</sub> 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>2e</sub> .	<a href="#">The Economic Value of Private Forests and Climate Change Mitigation</a>
Standard of “additionality”	<p>Carbon storage must be real and additional to the amount of carbon that would have occurred if a forest was not enrolled in a carbon program.</p> <p>To determine how much carbon storage is “additional” due to forest management, project managers must estimate how much carbon would have been stored and sequestered under a business-as-usual scenario, (i.e., without the intervention). The projected emissions amount in the business as usual scenario constitutes the baseline carbon values.</p> <p>Additional net carbon sequestration is the difference between the real, measured emissions resulting from a change or changes in forest management versus the projected baseline value.</p>	<p><a href="#">How to Manage Forests for Carbon</a></p> <p><a href="#">Carbon Accounting in Forest Management</a></p> <p><a href="#">How a Forest Carbon Offset is Made and Sold</a></p>

<p>Standard of “nonleakage”</p>	<p>Project developers must defend that their additional carbon storage has not led to 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 to meet continuing market demand.</p>	<p><a href="#">Carbon Accounting in Forest Management</a></p> <p><a href="#">How a Forest Carbon Offset is Made and Sold</a></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 can be up to 100 years <i>beyond</i> a project’s credit-generation period.</p>	<p><a href="#">Carbon Accounting in Forest Management</a></p> <p><a href="#">How a Forest Carbon Offset is Made and Sold</a></p>
<p>Standard-setting bodies or offset programs</p>	<p>Independent organizations that develop protocols, or approved project methodologies.</p>	<p><a href="#">Forest Carbon Market Structures and Mechanisms</a></p> <p><a href="#">How a Forest Carbon Offset is Made and Sold</a></p>

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>
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.	<a href="#"><u>Forest Carbon Market Structures and Mechanisms</u></a>
Weather	The current state of the atmosphere, ranging from a few minutes to weeks.	<a href="#"><u>Climate Regulation and Change: What is Causing it?</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>