



MEETING THE CHALLENGE OF CLIMATE CHANGE:

How Land Trusts, Policymakers, and
Public Agencies Can Achieve Carbon Goals
through Strategic Forestland Protection



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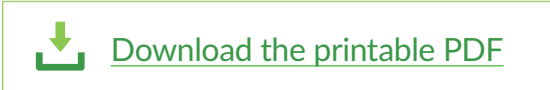
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COMMONLY USED CARBON TERMS

Net-Zero Carbon Emissions: Balance between the amount of greenhouse gas produced and the amount removed from the atmosphere. When we remove as much carbon from the atmosphere as we put into it, we have reached net-zero carbon emissions.

Carbon Storage: Forest ecosystems store carbon in the roots, trunks, and branches of trees; soil layers; and forest products. Permanent protection and carbon-friendly management of forestland can avoid release of stored carbon back into the atmosphere through development and heavy cutting, while sustainable forest management can reduce damage from insects and fire.

Carbon Sequestration: The ability of trees to absorb — or sequester — carbon dioxide emissions from the atmosphere through the natural process of photosynthesis. Sequestration happens naturally as forests grow. Planting new forests, improving soil health, and implementing best practices for forest management can contribute to increased rates of sequestration.

Natural Climate Solutions: A suite of conservation, restoration, and improved land management [interventions — such as natural forest management, cover cropping, and avoided conversion](#) — on natural and agricultural lands that increase carbon storage and reduce greenhouse gas emissions. Tools to support implementation of natural climate solutions are available [online](#).



Opportunity and Responsibility: Climate, Forests, and Land Protection

The necessity of urgent action on climate change is well documented. Global carbon dioxide emissions must be reduced now, allowing us to reach 'net zero' no later than 2050 and avoid even more substantial damage to our economy, environment, health, and well-being. (See sidebar 1 for definitions of key terms).

Those of us involved in land protection and management — and forest protection and management, in particular — have a critical role to play in fighting climate change.

With slight adjustments to our forestland conservation practices, we can ensure we protect stored carbon and manage for increased absorption, thus reducing carbon emissions in the atmosphere and their devastating impacts.

How significant is our opportunity?

In the fight against climate change, the protection of our nation's forests is incredibly important. Forests in the United States currently store 59 billion metric tons of carbon in trees, roots, soils, and forest products — the equivalent of more than 33 years of U.S. emissions.

In addition, as they grow, forests absorb — or sequester — more carbon from the atmosphere: Every year, [U.S. forests sequester the equivalent of 14% of the country's carbon dioxide emissions](#).

In fact, in the United States, research indicates that [natural — or land-based — climate solutions](#) can offset an additional 21% of annual greenhouse gas emissions beyond what forests already absorb.

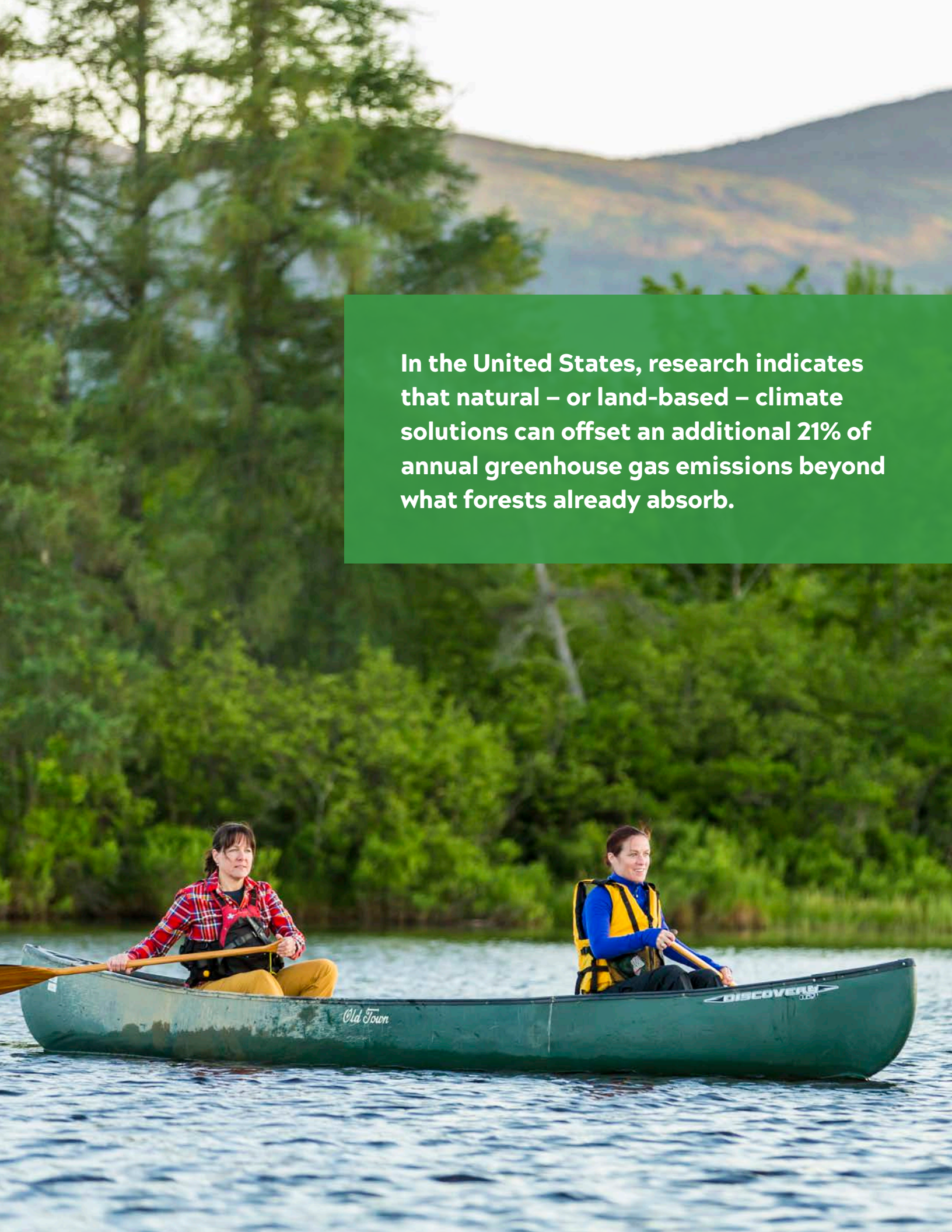
Forests — and the carbon they store — are at risk.

In the lower 48 states, [nearly one million acres of forest land is lost to development and other uses each year](#). This is the equivalent of losing more than 100 acres of forest each hour.

This loss is compounded by other factors such as the unsustainable harvesting of trees; high-severity wildfires in the West; and forest-health concerns like drought, pests, and disease nationwide.

Fortunately, with thoughtfully targeted land protection and careful management of protected forests, land trusts and public agencies have the opportunity to protect our planet by saving forests and increasing their ability to absorb carbon.

Together, forest protection and management offer some of the biggest opportunities to act on natural climate solutions in the United States.

A photograph of two women in a green canoe on a lake. The woman on the left is wearing a red and white plaid shirt and yellow pants. The woman on the right is wearing a blue long-sleeved shirt and a yellow life vest. The canoe is green and has "Old Town" and "DISCOVERY" written on it. The background shows a dense forest of green trees and a mountain range in the distance under a clear sky.

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ONLINE CARBON TOOLS

There are a number of publicly available free carbon datasets useful for understanding where land protection and restoration might be effective strategies for protecting existing carbon stores or sequestering more carbon.

Two online tools make these data readily available:

[Forest Carbon Map](#) developed by The Trust for Public Land and American Forests.

This tool uses U.S. Forest Service Forest Inventory and Analysis (FIA) program data and runs on a simple web platform that allows users to view carbon stocks at the county, state, and national scale. The analysis can be further broken down by where the carbon is stored and by ownership types. In addition, users can analyze threats to carbon loss and potential co-benefits.

[Resilient Land Mapping Tool](#) developed by The Nature Conservancy.

This tool lets users view TNC's resilience analysis results alongside forest and soil carbon estimates across the lower 48 U.S. states. Data are displayed at the 30-meter scale. The site allows the user to upload a parcel or draw a polygon to calculate total carbon stored based on estimates for 2010 and 2050. [The data were developed](#) by Dr. Christopher Williams at Clark University based on carbon cycle models trained to match FIA data.

Here's How:

Define Priorities and Practices


Land trusts, policymakers, and public agencies can maximize the benefits of forest protection by embracing three critical principles:

Protect forests that provide the greatest climate value and are at greatest risk.

Each year, land trusts protect nearly 2 million acres in addition to the millions of acres protected by state, federal, and tribal governments. Like habitat or water quality, forest carbon can be used to prioritize conservation projects. When deciding where to invest limited land protection dollars, a set of climate-related factors should be prioritized.

1. CARBON STORAGE

Healthy older forests store the largest amounts of carbon. [Their loss could release decades of stored carbon](#) and have severe detrimental climate impacts. To optimize protection of large carbon stores, online tools are available to identify forests with above average carbon. (See sidebar 2 for details.)

A photograph of a lush, temperate rainforest. The scene is dominated by tall, slender trees with thick, moss-covered trunks. The forest floor is covered in a dense carpet of green moss and ferns. In the foreground, a large, fallen log lies horizontally, also heavily covered in moss. The lighting is soft and diffused, creating a serene and verdant atmosphere. A semi-transparent green box is overlaid on the middle of the image, containing white text.

Regardless of age, healthy forests will continue to absorb carbon from the atmosphere. However, to reach net-zero by 2050, we should target land protection to forests that will store the most carbon by that date.



2. CARBON SEQUESTRATION

Regardless of age, healthy forests will continue to absorb carbon from the atmosphere. However, to reach net-zero by 2050, we should target land protection to forests that will store the most carbon by that date. (Estimates of 2050 carbon storage are available in the [Resilient Lands Mapping Tool](#) described in sidebar 2.)

3. AT-RISK FORESTS

Deforestation, development pressures, and the threat of wildfires place high-value, carbon-rich forests at risk and make the need for protection and management urgent. While large-scale trends of historic forest loss are well mapped, the future risk of forest loss within a more specific geography is often best assessed by land trusts, public agencies, and others with local knowledge. (Broad-scale data on forest risk are available in the [Forest Carbon Map](#) described in sidebar 2.)

Considering these factors together – in combination with other forest values, such as [ecological resilience](#) – will allow us to focus on forests that most need protection and also have the most to offer in fighting climate change.

Secure carbon-minded easement terms.

Just because land is protected doesn't mean it's protecting the forest carbon.


[Land trusts hold more than 17 million acres in easements](#). However, while most easements protect against development, they do not always address forest management, putting stored carbon at risk and reducing the potential for carbon capture.

A few simple easement terms can help create the legal basis for protecting forest carbon.

This could mean:

- including carbon storage among the purposes for an easement;
- enumerating a property's value for carbon storage and absorption in an easement's recitals;
- establishing enforceable and clear standards for permanent protection of forest carbon in an easement's restrictions and reserved rights;
- including a description of a project's forest carbon attributes in its baseline documentation report; and
- considering [easement language that facilitates a planned carbon sale](#), if carbon offsets are of interest.

Land protection with easement terms that protect carbon stocks provide a permanent climate and conservation benefit.

A photograph of a forest at sunset. The sky is filled with soft, golden light filtering through the clouds. In the foreground, there are two large stacks of cut logs, one on the left and one on the right, separated by a dirt path. The background shows a dense forest of tall trees. A green semi-transparent box is overlaid on the left side of the image, containing white text.

While most easements protect against development, they do not always address forest management, putting stored carbon at risk and reducing the potential for carbon capture.



Often conservation lands need to meet economic or ecological goals. Fortunately, carbon-friendly management is compatible with these other benefits. In fact, good forest management is good carbon management.



Manage protected lands with carbon-friendly practices.

More than 40% of the 740 million acres of U.S. forestland is in public or private conservation ownership. Carbon-friendly management of already protected land is one of the low-cost ways we can advance climate goals.

Often conservation lands need to meet economic or ecological goals. Fortunately, carbon-friendly management is compatible with these other benefits. In fact, good forest management *is* good carbon management.

Carbon-friendly management supports forest growth while enhancing resilience to destructive insects, disease, fire, and other risks. Replanting cleared trees, thinning young trees, and supporting a diverse forest structure and composition reduces the severity and extent of loss from natural stressors and can increase carbon capture.

And, remember: Management for forest sequestration can meet both ecological and economic goals. Recent studies indicate [wild, older forests continue to sequester carbon that is often stored as soil deposits](#), and [research in the Northeast](#) shows that landowners can increase carbon storage while increasing the volume of good quality timber.

Detailed guidance describing carbon-friendly forest management practices is available. The Northern Institute of Applied Climate Science's "[Forest Carbon Menu of Adaptation and Mitigation Strategies and Approaches](#)" is one example that is applicable across the United States. Other approaches have been developed regionally such as New England Forestry Foundation's [Exemplary Forestry practices](#).

Seize the Moment

Recognition of forests' role in helping address climate change is quickly growing throughout the United States, and with heightened recognition come opportunities—for funding, policy victories, and regional planning successes.

President Biden has called out the need to leverage natural climate solutions to help achieve net-zero carbon by [conserving 30% of America's lands and waters by 2030](#), and, as members of the [United States Climate Alliance](#), nearly half of U.S. states are making commitments to help meet this goal.

The [Forest Carbon Working Group](#), a coalition of NGO and private forest interests working to advance climate change solutions, has set out an ambitious and valuable [policy agenda](#).

The [Open Space Institute's](#) Appalachian Landscape Protection Fund provides grants for land trusts to put the guidance highlighted here into practice in select regions of the Eastern United States.

Nationally, [programs are being developed to help landowners and land trusts realize revenue from voluntary and compliance carbon markets](#), creating opportunities to landowners of many sizes.

Finally, major media outlets including [The New York Times](#), [The Wall Street Journal](#), and [CNN](#) are dedicating valuable space to forest carbon.

To seize these opportunities, we must know what we want to say and what actions we must take.

We do; and the time for action is now.

A person wearing a red helmet, a green jacket, and orange gloves is riding a mountain bike on a dirt trail in a forest. The trail is covered with fallen brown leaves. In the background, there are many trees and a large, moss-covered log. The scene is set in a wooded area with a mix of deciduous and evergreen trees.

IN SUMMARY

Protected and well-managed forests provide permanent climate benefit. In addition to carbon storage and absorption they support clean water and air, jobs, recreation, and wildlife habitat.

We have it in our power to protect forest carbon for nature and people. The principles, data, resources and guidance we need are available. With them, we can advance land protection, bring others onboard, support policy and funding outcomes, and make a critical contribution to the challenge of climate change.



View of the east branch of the Penobscot River in Maine. (Photo by Jerry Monkman).

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