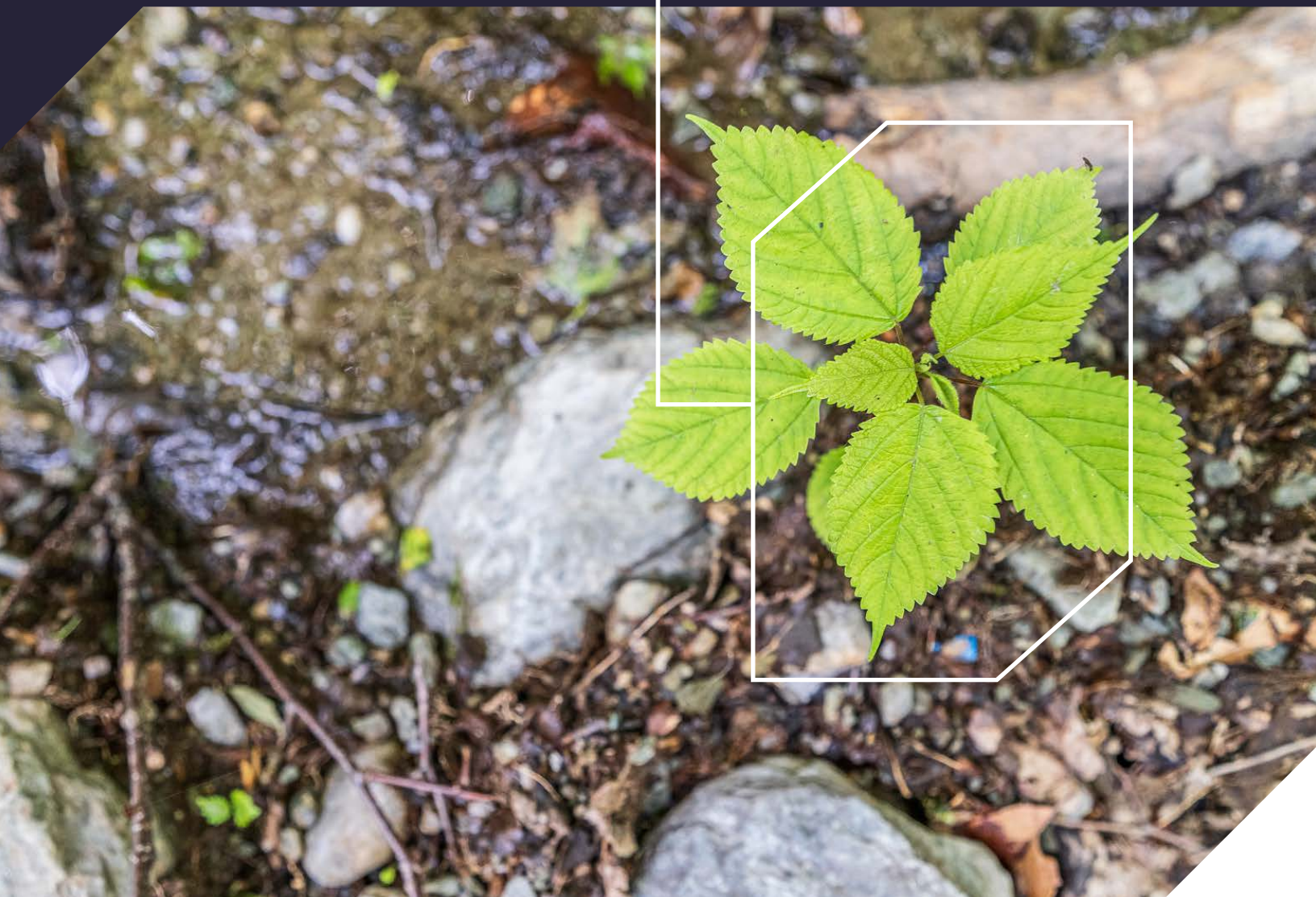
chestnut

A tech-driven approach to nature-based carbon capture



A tech-driven approach to nature-based carbon capture

Most companies remain committed to reducing their carbon footprint despite global uncertainty around net-zero strategies. These organizations recognize that carbon removal is an essential mechanism to achieving climate goals while actively decarbonizing operations and supply chains. As a result, carbon credit buyers are demanding rigorous verification and measurement to ensure real climate impact.

In an environment where reliability of data and reporting is paramount, carbon capture through engineered solutions tends to get more attention than nature. Nature-based carbon capture projects often suffer from the misperception that they cannot be accurately measured or verified.

Yet, by combining cutting-edge technology with robust analysis from a range of data sources, nature-based solutions can deliver the same verifiable carbon capture—allowing organizations to quantifiably achieve their carbon reduction goals while simultaneously offering additional environmental and community benefits.

Chestnut's competitive advantage

Chestnut Carbon takes a high-tech approach to one of nature's oldest processes, forest-based carbon removal. Our proprietary data sets, combined with sophisticated technology tools, optimize every aspect of our projects.

While many nature-based project developers rely on publicly available data sources and remote sensing, our team of carbon scientists and forestry experts utilize our proprietary tools to continuously improve our data sets and models. Our custom-built technology enables Chestnut to credibly adapt, grow, and scale with the market.

We believe that Chestnut delivers the most accurate and cost-effective nature-based carbon capture solutions available today. The result is accurate, verifiable carbon credits that represent true climate impact.

Our process

At Chestnut Carbon, we developed a proprietary tool, the Chestnut Land Explorer, that employs public and private data to identify the U.S. regions in which trees absorb the highest volumes of carbon. This allows us to identify land with the optimal productivity for our afforestation program and evaluate private forest landowner candidates for our improved forest management program.

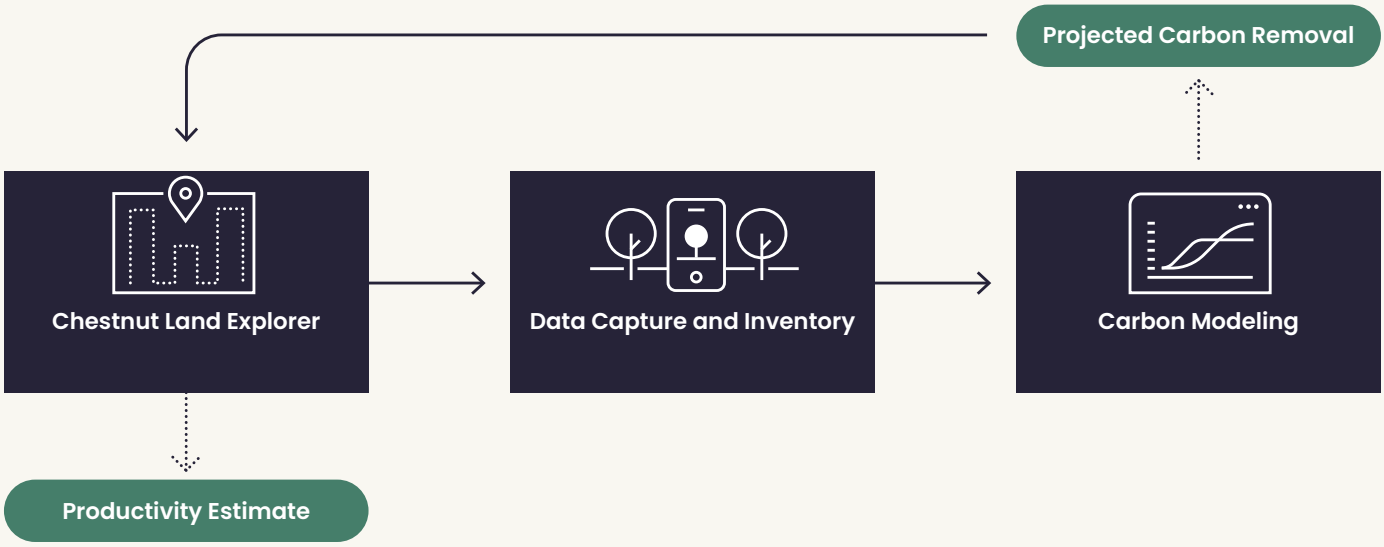
For our Improved Forest Management (IFM) project, we collect detailed tree inventory data using a custom, portable device which we have patented. These measurements allow us to create accurate forward yield models for carbon storage. Our novel method is faster, at a lower cost, than traditional inventory methods and has been approved by our 3rd party auditors and registry (Verra).

For our Forest Restoration/Afforestation (ARR) project, the Chestnut Land Explorer platform helps refine our purchase decisions as we acquire marginal land across the Southeastern US for planting.

We leverage our proprietary modeling tools to create detailed maps and carbon sequestration projections of each property, which we use to calculate the tons of carbon removal underlying our credits. This unique, tech-driven approach allows us to deliver nature-based removal credits that are as reliable and impactful as credits sourced from an engineered solution, at a much lower cost than others in the market.

A blueprint for our tech-based carbon capture process

In this paper, we will dive deeper into each component of our technology suite and how those components work together to optimize our process.



The Chestnut Land Explorer

The Chestnut Land Explorer is our proprietary data platform that utilizes spatial and remote assessment data sets to profile land across the entire continental U.S. Chestnut leverages a large collection of private and public data layers, including cadastral, remote sensing, and site surveys, to capture as much local variability as possible when estimating carbon sequestration potential.

Based on the Chestnut Land Explorer's analysis, each plot of land is assigned a Carbon Productivity Estimate that our forestry professionals use to quickly assess site conditions. This allows us to accelerate the decision-making process when selecting new project output areas and ensure positive return on investment through reforestation or conservation.

Chestnut Land Explorer Outputs

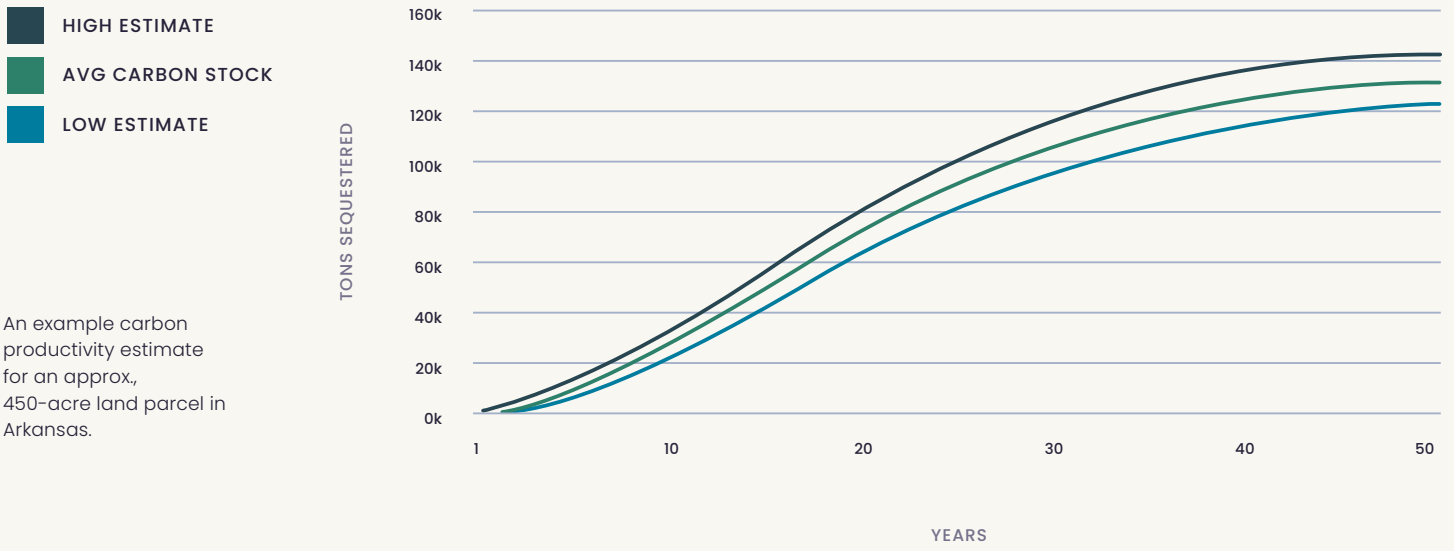
ARR:

During our initial assessment of unforested land, we identify an array of viable native tree species across soil types to model site-specific growth dynamics and silvicultural practices. These models project carbon sequestration results.

IFM:

An initial assessment of forested land provides a VCU (verified carbon unit) estimate for each acre.

Carbon Productivity Estimate



An example carbon productivity estimate for an approx., 450-acre land parcel in Arkansas.

Data Capture and Inventory

In 2024, we patented our proprietary technology device that allows us to collect forest inventory more quickly and more efficiently than most other options in the market.

For our IFM program, we use this device to efficiently and cost-effectively collect the required forest data on a given property. On-site carbon inventory collection utilizes our data platform and carbon measurement processes to create an in-depth forest assessment and accurate carbon yield models.

Properties are inventoried using the device to collect metrics related to tree height, species, mortality, and defects. The results are used to accurately quantify the amount of carbon stored in any given forest, as well as evaluate how much carbon removal that forest will yield over our 60-year plus project duration.

Traditional forest inventory capture requires more time, the use of multiple costly tools, and the need to enlist a registered forester to undertake the process. Our process provides the same measurements using a single device. This allows us to easily train a wide range of qualified technicians to use it, not just registered foresters, and to access technicians nationwide, resulting in significant cost savings.

While other carbon projects often rely exclusively on remote sensing data from aerial imagery, our approach offers greater accuracy and the ability to collect and review real, tangible, site-specific tree data in a cost-effective way. Once the data is collected, it flows directly into our inventory management software for analysis and processing.

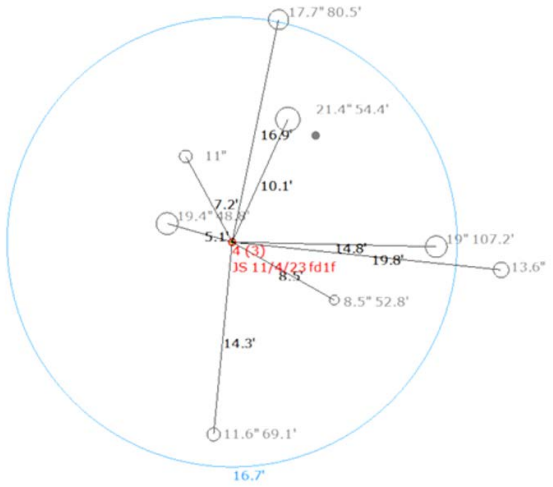
For our ARR project, we take the recommended native tree species and soil types from the carbon productivity estimate to design a formal planting plan. Our team works with many local specialists to plant a biodiverse array of hardwood and pine seedlings, optimized for each region's soil, drainage, native species, and community land use. Once the trees grow large enough to measure the carbon sequestered, we begin using our physical device for on-the-ground monitoring and verification.

Our patented device attaches to a smartphone for easy use in the field.

Carbon capture modeling

Equipped with the initial carbon capture analysis and site-specific inventory data, we use Chestnut's proprietary modeling tools to analyze each property in detail.

First, the data is used to generate a detailed visual representation of each plot. These diagrams not only capture field conditions but also allow us to compile a complete inventory with metrics for each individual tree in multiple digital formats. Then, layout maps are modeled using a combination of our proprietary data with growth projections generated by the United States Department of Agriculture (USDA) Forest Service's Forest Vegetation Simulator (FVS). The FVS simulator uses data based on the USDA's Forest Inventory and Analysis National Program that has been collecting forest data for over 100 years. The modeling process results in precise carbon sequestration calculations and projections over time for each parcel analyzed.



Data captured in the field provides detailed visual representations of each plot in multiple digital formats.

We model future biomass growth by accounting for tree growth rates, soil conditions, and location-specific variables, using actual regional harvest data to parameterize our baselines. This data is collected on an ongoing basis with support from our forestry team and partner foresters. We revise the baseline every 10 years to update for changing harvest conditions.

By simulating forest dynamics over time and under various management scenarios, we generate accurate carbon sequestration projections based on detailed silvicultural plans and baseline conditions. These rigorously tested methods ensure delivery of the projected outcomes.

A reliable method

Once modeling is complete, we process the data using our carbon accounting tools to project carbon removal over time. This detailed analysis quantifies the mass volume and tons of carbon stored in the projected tree list, providing a reliable and verifiable foundation for calculating carbon credits.

We also compare the emissions reductions resulting from the project to a baseline scenario, adjusting wood products that would have been removed and carbon leakage using established methodologies. This data-driven process ensures that carbon credits are accurately calculated based on factors such as initial forest density, growth rates, existing harvesting constraints, and local best management practices.

Ongoing analysis and data enhancement

The data and productivity analyses are further used to continuously enhance our technology platform—feeding back into the carbon modeling tools to refine future productivity estimates. By expanding our proprietary forestry and carbon capture data, we streamline the overall collection and analysis process—a continuous improvement cycle that helps increase accuracy and reduce costs for future carbon capture projects.

Our modeling tools and resulting carbon removal projections are the final component in a sophisticated system of solutions and processes designed to instill buyer confidence and prove the reliability of our methods.

Delivering measurable, durable carbon capture

In an increasingly complex carbon market, it's incumbent upon developers to proactively address buyers' concerns around carbon projects. Chestnut's robust data infrastructure and cutting-edge technologies allow us to deliver accurate projections of forest carbon yield and carbon removal of the highest integrity. Our suite of solutions provides what we believe to be the most scalable and rigorous methods available today for nature-based carbon project development—at a lower cost than most carbon removal options currently available.

Our transparent approach gives buyers confidence in selecting Chestnut as their partner for long-term, reliable, nature-based carbon removal. We are setting a new standard for offering high-quality U.S.-based carbon projects that earn market credibility and deliver environmental impact.

About Chestnut

Chestnut Carbon is a leading developer of nature-based carbon removal credits. Founded in 2022 with the support of energy-focused alternative asset manager Kimmeridge, Chestnut generates U.S.-based, high-quality forest carbon offsets that are durable and verifiable to accelerate the path to net zero across a range of industries.

We use a proprietary approach to developing carbon offset projects on family-owned forestland and marginal cropland and pastureland. Our credits are the very definition of additional; our projects result in carbon removals that would not have occurred in the absence of carbon markets. We stand behind the long-term durability of our carbon removal in private ownership of the land and risk mitigation practices.

Our expertise is driven by an experienced team, whose diverse backgrounds include forestry, carbon regulation, environment, finance, and land management.

We help sustainability-focused organizations meet their net-zero goals by adhering to the highest standards in today's markets. Learn more at chestnutcarbon.com.

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