

# North Carolina— Building leadership in industrial carbon removal

North Carolina's industry, natural beauty, and renowned research institutions provide many opportunities for deploying carbon removal projects that would support the state economy and climate. Projects that can integrate with manufacturing processes for more efficient American production, enhance local agriculture, develop replacement building materials, and protect miles of coastlines are already underway, laying the groundwork for significant co-benefits for state residents.

## How It Works

Forests, coastlines, and farmlands all contribute to the promise of carbon removal in North Carolina. Almost two-thirds of the state is forested, with another 8.1 million acres of farmland, capable of contributing enough biomass for 20.4 million metric tons of durable carbon removal per year. Agricultural areas can also benefit from enhanced weathering, in which crushed rock spread on farmland accelerates the naturally occurring cycle of minerals that store carbon while potentially replacing other soil amendments. Coastlines provide additional opportunities for carbon removal, including deploying crushed rock in coastal waters while restoring coastlines and marine ecosystems damaged by hurricanes and threatened by acidification and rising water levels.

In a state with a long history as a leader in American manufacturing, including chemicals, textiles, and paper and pulp, opportunities for integration with carbon removal are plentiful. Many of these industries face increasing international competition and off-shoring, and integrating carbon removal can improve process efficiency and waste management. Examples include adding minerals during wastewater treatment to manage acidity while removing carbon, and stabilizing sludge to store the carbon in the

waste. Similar approaches can also be used in municipal wastewater treatment plants, both the management and disposal of biosolids and the addition of materials like calcium carbonate during the treatment process, and several of these projects are already underway across the nation. North Carolina also has several companies deploying direct air capture (DAC), which removes carbon dioxide directly from ambient air. With a suitable supply of low-carbon energy and transportation infrastructure, DAC could provide nearly 18 million metric tons of carbon removal each year.

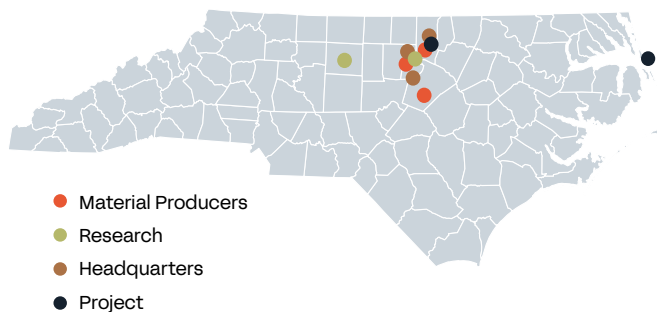
## How It Benefits North Carolina

Advancing carbon removal in North Carolina could provide a host of co-benefits for industry and agriculture across the state. Carbon removal with alkaline minerals on farmlands can provide improved crop yields, soil health, and financial incentives to many of the 42,000 farming operations in the state.

The state's universities boast some of America's leading precision agriculture and forestry researchers who could eventually develop guidance for the best ways to use carbon removal technologies while improving crop production around the world. Coastal communities can tap into carbon removal projects to simultaneously provide coastal protection and reduce ocean acidification, making the environment more hospitable for aquaculture, like oyster farming, and improving ocean and coastal ecosystems.

Manufacturing and construction will also benefit. Companies in North Carolina are already producing drop-in alternatives for building materials that can capture and store carbon dioxide, such as a plywood replacement made from rapidly growing plants that can store more carbon than lumber and biocement that uses carbon storing minerals produced by microorganisms. New construction, and even rebuilding from natural disasters, can provide manufacturing and construction jobs while storing carbon for at least the life of the building. Companies mining suitable basalt and olivine for soil amendments and producing sorbents that capture carbon dioxide for DAC are also currently operating in North Carolina. Each of these intersections between carbon removal and industry can preserve American jobs in agriculture and manufacturing while creating new opportunities across the state, including a potential 11,500 jobs in DAC alone by 2050.

## Carbon Removal Companies and Research in North Carolina



### CRA MEMBER COMPANIES

8 RIVERS

LITHOS



### WHAT THEY'RE WORKING ON

**Lithos:** Partnering with NC-based Sunrock Industries and local farms, Lithos supports agricultural productivity and improves soil health.

**Vesta:** Operating a coastal restoration and carbon removal project in Duck, NC, with research collaborators that include the Army Corps of Engineers.

## North Carolina Carbon Renewal Key Institutions + Players

### UNIVERSITY RESEARCHERS

Universities across the state, including Duke, East Carolina University (ECU), North Carolina State University (NCSU), North Carolina Agricultural and Technical State University (NC A&T), and University of North Carolina (UNC) all have research efforts underway for carbon removal.

- ECU and The Coastal Studies Institute (CSI) have partnered with Vesta to assess coastal community perception of carbon removal, and CSI is also contributing to the environmental monitoring of the coastal carbon removal pilot in Duck.

- NC A&T is using DOE funding to research carbon removal, converting carbon into useful chemicals, and enhancing agricultural soil carbon storage.
- NCSU has research groups specializing in biocarbon, precision agriculture, and advanced manufacturing, which can all integrate with carbon removal practices.
- Multiple labs at Duke are researching carbon removal solutions and materials.

### FARMS AND AGRIBUSINESS

Deployment of land-based carbon removal depends on partnerships with the owners of farmlands and agribusiness. North Carolina is already hosting pilots and commercial projects on farmlands, including Lithos's Carbon Negative Shot project, funded by the Department of Energy, and planning is underway for additional projects.

### SOUTHERN STATES ENERGY BOARD

The U.S. DOE funded the Southeast DAC hub to perform front-end engineering design studies for two DAC facilities capable of 50,000 net metric tons of carbon removal capacity. The project is led by the Southern State Energy Board (SSEB) with 8 Rivers and RTI International.

### RTI INTERNATIONAL

With well over a decade of experience and funding for work in carbon capture and utilization, RTI International is leading efforts with industry to use carbon in industrial processes like pulp and paper and capturing carbon produced during cement production. They also co-hosted a 2024 accelerator focused on carbon dioxide removal startups.

1. North Carolina Forest Service
2. US Department of Agriculture
3. Roads to Removal
4. Rhodium Group
5. US Department of Agriculture
6. Project Vesta
7. Rhodium Group
8. Vesta
9. Department of Energy
10. Southern States Energy Board