

Southern forests' ability to suck carbon from the air may be slowing

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When U.S. Forest Service scientist David Wear hikes the trails crisscrossing the Appalachian Mountains, he pauses to revel not only in the beauty and solitude, but also to consider the remarkable role that the forest around him plays in the world's environment.

"A walk in the woods is as much recreation as intellectual stimulation for me," Wear said. "I see questions about what's happening in the changing dynamics of the forests."

One of those questions: How are today's forests doing when it comes to sucking [carbon](#) out of the atmosphere?

Wear and two Forest Service colleagues, John Coulston and Jim Vose, recently completed a study examining the carbon accumulation levels of forests in the southern United States.

They discovered a possible reduction in the ability of these forests to absorb carbon. That worries Wear and his colleagues because carbon dioxide is the main greenhouse gas that causes [climate change](#).

The trio of scientists, who worked out of the Forest Service's Southern Research Station, recently had their findings published in the journal *Scientific Reports*.

The study examined the impacts on forests from such things as fire, disease and cutting, as well as the effects of changing land uses. Data were collected from 40,000 locations from Virginia to Louisiana.

Forests are among nature's most efficient and reliable systems for sucking up and storing carbon dioxide from the atmosphere.

Trees use the [carbon dioxide](#) in photosynthesis - the process that allows all plants to live and grow.

The scientists said forests in the southeastern U.S. provided a good workshop because they have more [forest](#) land than 96 percent of the countries in the world. Further, the forests in the 11 states studied absorb an estimated 15 percent of the carbon emission generated by energy- and transportation sources in the United States.

"This is clearly about climate change mitigation," Wear said. "We are concerned about sequestering carbon from the atmosphere."

The question, Coulston said, is what happens if the capacity to absorb carbon becomes less efficient or less resilient.

"Greenhouse emissions go up," he said.

The study shows that future carbon accumulation rates in the forests are sensitive to land-use changes. Choices for land use that either reduce the rate of reforestation or increase the rate of deforestation are key factors in future forest carbon accumulation, according to the study.

"The potential for future carbon accumulation in forests is uncertain due in part to the combined effects of changes in forest growth rates, land use choices, forest management," and a number of other factors, including the direct and indirect effects of climate change, according to the report.

And it's not that there's less forest in the study area. There's actually a little more because the amount of agricultural land being returned to forest has slightly offset the amount of forest lost to urban development, Coulston said.

The biggest factor is the age of the forests. They are getting old. And old trees don't have the same capacity to absorb carbon as younger trees because they are not growing as fast.

The scientists say they hope the study will help

policymakers understanding what's happening in the forests of the South so that information can be considered when addressing climate change.

"It allows for planning and strategizing to include carbon absorption by forests so that it can be factored into policy goals for emissions," Coulston said.

"When considering emission-reduction targets, you need to know what's emitting and what's absorbing. Forests are a large factor."

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