

Carbon accumulation by Southeastern forests may slow

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Carbon accumulation levels in the Southeastern U.S. may be slowing due to forest dynamics and land use changes, according to findings of U.S. Forest Service researchers published in the journal *Scientific Reports*, Friday.

The study authored by Forest Service Southern Research Station (SRS) scientists John Coulston, David Wear, and Jim Vose is the first to isolate the impacts of [forest](#) disturbances, such as fire, disease, and cutting, as well as the impacts of land use change using permanent monitoring locations across the Southeast, making it one of the most thorough carbon studies completed.

Researchers show that future carbon accumulation rates are highly sensitive to future land use changes. Land use choices that either reduce the rate of afforestation or increase the rate of deforestation are key factors in future forest carbon accumulation.

"Future land transitions are uncertain but relatively small changes in afforestation from agriculture resulted in substantial decrease in accumulation rates," said Coulston. "While tree-cutting did cause a decrease, overall [forest growth](#) was much greater, partly due to the rapid growth of younger forests."

The aging of forests in the region was also a significant force behind potential slowing accumulation rates as growth rates are typically lower for older forest. The study found forests to be fairly resilient to natural disturbances caused by weather, insects, diseases and fires. These disturbances reduced carbon accumulation rates but the losses were compensated by subsequent regrowth and storage of dead material on the site.

"These findings highlight the need for careful assessments of policies that affect forest management and land use changes in rural areas of the Southeast," said Wear, project leader of the

Station's Center for Integrated Forest Science. "Continued forest carbon accumulation in the region is highly sensitive to land use transitions."

The impact of land use transition is especially significant in the Southeast where 89 percent of the forested land is privately owned, underscoring the importance of land use policies that provide incentives for keeping lands in a forested condition.

The study estimated impacts on forest carbon accumulation in the region between 2007 and 2012, and projected potential changes out to 2017 based on forest growth and land use change scenarios.

More information: *Scientific Reports*, [www.nature.com/srep/2015/15012 ... /full/srep08002.html](http://www.nature.com/srep/2015/15012.../full/srep08002.html)

Provided by USDA Forest Service

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