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Amy Seif

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# Scientists Provide New Understanding of Carbon Sinks

## UNH Researchers Part of International Team

By [Amy Seif](#)  
*Communication and Information Coordinator  
Institute for the Study of Earth, Oceans, and Space  
603-862-5369*

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DURHAM, N.H. -- A paper to be published Nov. 8 in the journal *Nature* provides the latest understanding on the uptake of carbon by ecosystems. It takes a new look at evidence for previous assertions that the United States plays a larger role in the uptake of excess carbon dioxide than Europe or Asia.

"This paper warns that it is too early to make claims about patterns of carbon sources or uptake, referred to as 'sinks,' at the national level," says Bobby Braswell, research assistant professor at the University of New Hampshire's Institute for the Study of Earth, Oceans, and Space (EOS) and co-author of the paper. "However, there are many things that are now more certain, including the average magnitudes of carbon sinks for particular latitudes. We can compare averages of places in the south to places in the north."

Braswell describes the paper as a follow-up to the carbon cycle chapter in the International Panel on Climate Change's (IPCC) third assessment report, as well as "a summary of state-of-the-art knowledge about the terrestrial part of the global carbon cycle." The article is entitled, "Recent patterns and mechanisms of carbon exchange by terrestrial ecosystems," and was co-authored by an international team of 30 leading carbon scientists.

EOS Director Berrien Moore, a co-author of the IPCC report and *Nature* paper, explains, "This article reflects the consensus of scientific research regarding potential carbon sinks."

The paper states that terrestrial carbon sinks cannot be counted on indefinitely to take up a large part of the excess carbon dioxide that is being emitted from industrial and automotive sources. According to Braswell, every process that contributes to the uptake of carbon has a limit that could be reached within the next century.

Much of this enhanced carbon uptake occurs during the recovery of forests from abandoned agriculture, however, a limited amount of land is available for this re-growth. Plant uptake of carbon increases when more carbon dioxide enters the atmosphere, but this too provides diminishing returns over time.

"Based on what we know about the mechanisms involved, ecosystems will begin to play a smaller and smaller role in the uptake of industrial carbon over the next century," Braswell says.

An additional finding discussed in the article is evidence for a significant and inexplicable tropical carbon sink. Forests can be both a source of carbon or a sink. The tropical forest ecosystem appears to be an important carbon sink, but this process is not yet understood.

Says Braswell, "We need to improve our understanding of how climate and ecosystem functions interact and to get that understanding into the models. At the same time, there is a need for more comprehensive data about carbon in the atmosphere."

For more information contact Braswell at 603-862-2264 or Moore at 603-862-1766. Kathy Hibbard, another co-author at EOS, is also available for comment. Contact Hibbard at 603-862-4255.

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