Science

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Researchers find Amazon 'exhaling' carbon dioxide

The Associated Press

U.S. and Brazilian researchers say waterways in the Amazon are exhaling far more carbon dioxide into the atmosphere than previously thought — a finding that suggests tropical rainforests are not carbon "sinks" and offers new clues to how carbon is naturally absorbed and released worldwide.

On the Web

- NSF: The Amazon, a Big Natural Laboratory
- Carbon in the Amazon River Experiment Web site
- Resources: Climate change science

Using satellite radar imagery and streamflow measurements, researchers determined that the amount of carbon dioxide naturally coming off rivers, streams and flooded areas in the vast Amazon basin is triple what they expected to find.

The study estimates that purely aquatic processes accounted for roughly 20% of the carbon released from the waterways, while the rest originated in the forest — swept into rivers by rains and floods that draw carbon from soil and carry woody debris, leaves and other organic matter downstream.

The carbon-dioxide release into the atmosphere takes several years to complete as trees and plants decay.

"If you want to know where carbon from today's tropical forest goes, look 1,000 kilometers downstream in 20 or 30 years," said University of Washington oceanographer Jeffrey Richey, who dubbed the process "river breath." Richey was the lead author of the study, which appears in the April 10 issue of the journal Nature.

The project was supported by the U.S. National Science Foundation.

Using the Amazon findings, the researchers calculate that tropical forest waterways worldwide are emitting 2 trillion pounds of carbon dioxide

annually. That's equal to about one-fifth the amount of carbon dioxide generated every year by deforestation, burning fossil fuels and other human activities.

Worldwide, average annual temperatures have risen by more than one-degree Fahrenheit over the past several decades as levels of carbon dioxide and other heat-trapping pollutants have increased.

Some scientists have suggested that forests act as carbon "sinks" to absorb excess carbon and moderate warming trends. However, accurately calculating the forests' impact on a changing climate has proven to be difficult and complex.

The Amazon analysis is the second study in recent months to raise questions about carbon absorption in forests. Last May, researchers at Duke University showed that temperate pine forests in North Carolina, after an initial growth spurt, did not absorb as much carbon as expected as they grew older.

In an accompanying article in Nature, researchers John Grace and Yadvinder Malhi at the University of Edinburgh noted that more work is needed to pinpoint the precise origin of the carbon being released by waterways. The study provides "an estimate of the relative importance of these sources, but their figures are highly uncertain," the pair wrote.

Duke University ecologist Rem Oren said the Amazon research offers insight into the crucial understanding of how absorption and release of carbon balances itself out on a global scale.
