

As carbon emissions climb, so too has the Earth's capacity to remove CO₂ from the atmosphere

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A new paper, co-authored by Woods Hole Research Center Senior Scientist Richard A. Houghton, entitled, "Audit of the global carbon budget: estimate errors and their impact on uptake uncertainty", was published in the journal *Biogeosciences*. The paper confirms that as carbon emissions continue to climb, so too has the Earth's capacity to absorb carbon dioxide from the atmosphere. About half of the emissions of CO₂ each year remain in the atmosphere; the other half is taken up by the ecosystems on land and the oceans.

For Dr. Houghton, "There is no question that land and oceans have, for

at least the last five and half decades, been taking up about half of the carbon emitted each year. The outstanding question is, Why? Most of the processes responsible for that uptake would be expected to slow down as the Earth warms, but we haven't seen it yet. Since the emissions today are three times higher than they were in the 1960s, this increased uptake by land and ocean is not only surprising; it's good news. Without it, the concentration of CO₂ in the atmosphere would be twice what it is, and climate change would be much farther along. But, there's no guarantee that it will continue."

Since 1956, when the monitoring of atmospheric CO₂ concentrations began at Mauna Loa Observatory (MLO), many more stations have been added to measure the amount of carbon in the atmosphere and how it varies seasonally and geographically. The measurements provide the ability to detect changes in the behavior of the [global carbon cycle](#). This paper outlines a new framework for assessing errors and their impact on the uncertainties associated with calculating carbon sinks on land and in oceans.

Dr. Houghton and colleagues conclude that the greater certainty in atmospheric carbon measurements has led to an increased certainty in the calculated rate of [carbon uptake](#) by land and oceans. The scientists are confident that the rates have so far increased in proportion to emissions. Monitoring that uptake year by year is critical for understanding the carbon cycle and for knowing how to deal with it.

More information: Link to abstract: www.biogeosciences.net/12/2565...bg-12-2565-2015.html

Provided by Woods Hole Research Center

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