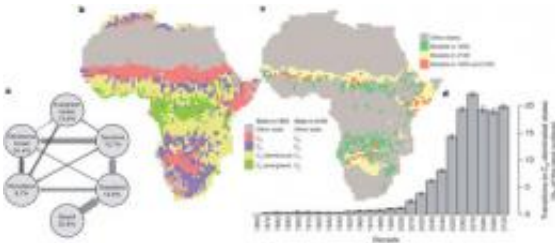


Rising CO2 levels likely to change vegetation locally more so than globally: study

June 28 2012, by Bob Yirka



Transitions between vegetation states projected for the period 1850-2100. Image (c) *Nature* (2012) doi:10.1038/nature11238

(Phys.org) -- In all the talk about global warming as a result of human created CO₂ emissions, it seems other impacts of higher levels of carbon dioxide on the environment tend to get overlooked. One of those impacts, argue German researchers Steven Higgins and Simon Scheiter, who have been building models showing what impact such levels might have on vegetation, is a likely shift away from deserts and grasslands to more woody areas and forests. The two have written a paper describing their findings which has been published in the journal *Nature*.

Everyone that's been to grade school knows that what we breathe out, plants breathe in, and vice-versa, thus more of what we breathe out, i.e. [carbon dioxide](#) (though from another source) should mean more for plants to breathe in, which should indicate better plant growth, more plant growth, or the switch from low level breathers to those that thrive

on more CO₂ in the air. Higgins and Scheiter suggest at least locally, that it's the last possibility that might create the most change over the coming decades as the Earth's vegetation slowly responds to finding more CO₂ in the air.

The two restricted their area of study to the African continent and found first that because grasses that live in the savannah tend to need less CO₂ to thrive than do trees, there are large swaths of the continent that favor savannah, which is demonstrated by the abundance of [grasslands](#) with the occasional stand of trees. Adding more CO₂ to the mix is likely to change that balance they show, to favor tree growth over grasses, leading to more woodland. They also found that increased CO₂ levels also tend to favor grasslands over [deserts](#), which for Africa should mean decreasing desert sizes.

Throwing a wrench into the whole works though is water, of course, in the form of rainfall. If there is no rain, a desert will always be desert. But because of changes in topography, rainfall levels can vary dramatically over short distances leading to differences in the impact of rising CO₂ levels. In areas with higher CO₂ and adequate rainfall, the trend will be from savannah to [forest](#), whereas in similar areas with less rainfall, trees might not be able to survive even with the addition of more CO₂, thus the area would remain savannah.

This all means, the two write, that Africa is likely to see significant change over the next few decades as CO₂ levels in the atmosphere continue to rise, causing significant changes to local areas of vegetation growth, depending on rainfall amounts, which will of course impact wildlife and the way the land is used by the people that live there, in ways that are impossible to predict.

More information: Atmospheric CO₂ forces abrupt vegetation shifts locally, but not globally, *Nature* (2012) [doi:10.1038/nature11238](https://doi.org/10.1038/nature11238)

Abstract

It is possible that anthropogenic climate change will drive the Earth system into a qualitatively different state¹. Although different types of uncertainty limit our capacity to assess this risk², Earth system scientists are particularly concerned about tipping elements, large-scale components of the Earth system that can be switched into qualitatively...

© 2012 Phys.Org

Citation: Rising CO₂ levels likely to change vegetation locally more so than globally: study (2012, June 28) retrieved 7 May 2024 from <https://phys.org/news/2012-06-co2-vegetation-locally-globally.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.
