



Respiration the forgotten flux: new insights on ecosystem respiration and its global significance

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There is strong evidence that most of the variability in the global carbon cycle is due to processes occurring in the terrestrial biosphere; however, identifying these processes is extremely challenging. The two largest fluxes in the global carbon cycle are gross primary productivity and total respiration of the terrestrial biosphere. Considerable research has focused on factors controlling primary productivity, but total respiration has received much less attention. Here results are shared indicating that much of the previously identified variability in the global carbon cycle is due to the temperature sensitivity of respiration in the tropics. Furthermore, the recent acceleration in net terrestrial carbon uptake is due to diminished respiration during the recent warming hiatus. Lastly, total soil respiration at the global scale is sensitive to precipitation and soil moisture. I hypothesize that this reflects the sensitivity of autotrophic respiration to precipitation and the sensitivity of heterotrophic respiration to soil moisture. I am seeking creative ways in which to experimentally test this hypothesis through experimental manipulation or model simulation.