

Interactive comment on “Using O₂ to study the relationships between soil CO₂ efflux and soil respiration” by A. Angert et al.

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Received and published: 18 February 2015

I would like to thank the reviewer for his through review.

The reviewer wrote that the idea that some of the soil CO₂ will dissolved into soil water or react with carbonates is not new. This is of course true, and we did cite relevant papers. However, as far as I know, this is the first time this is shown directly in soil profiles. Moreover, here we have actually quantified by direct measurements the fraction of respired CO₂ which reacted with the soil solution, and found it to be surprisingly large - over 70% of the respired CO₂ in some cases. This finding is new, and not known yet to most of the biogeosciences community which is measuring CO₂ efflux while reporting "soil respiration".

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The reviewer also asked why knowing soil respiration is more important than knowing the soil CO₂ efflux. This is of course depends on the focus of a particular study. For example, if the aim is to upscale point measurements, on particular dates, for the entire year and entire region, this is usually done by fitting the efflux data to some temperature and soil moisture functions - assuming that the efflux is controlled only by the biological response of respiration. Based on the data we show here, it seems important in some cases to correct the efflux to non-biological processes. We agree with the reviewer that this point should be more clearly explained in the introduction.

The detailed comments of the reviewer will help to improve the manuscript, and the next version of it will be corrected according to these comments, and we will provide a full report of the corrections.

Alon Angert

Interactive comment on Biogeosciences Discuss., 11, 12039, 2014.

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