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Biogeosciences Discussions

Interactive comment on "Direct and indirect metabolic CO_2 release by humanity" *by* Y. T. Prairie and C. M. Duarte

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This paper makes an interesting and worthwhile contribution to the understanding of how humans are an integrated part of the global carbon cycle. The measurements on the contribution of metabolic respiration are very welcome and an important addition to attributing processes to the many fluxes in an out of the biosphere.

I expect the paper will be accepted for final publication after the authors can address one major issue in the presentation and justification of the paper.

The authors justify the relevance of their findings on the basis that the human metabolic flux is not taken into account by IPCC scenarios and so underestimating the atmospheric CO2 growth (and of climate change). This is certainly for me the biggest issue

the paper is trying to contribute.

They also knowledge that most of the human/livestock metabolic and no-metabolic respiration is probably an internal process of recycling carbon (not a missed flux in the global calculations), except if they also account for the lost of C sink due to replacement of native vegetation for cropland which usually has a smaller C sink capacity. However, the paper does not provide a measure of the lost of C sink (which is used as the justification of the metabolic fluxes being an important and overlooked flux).

I agree that the human respiration component is largely an internal recycling process with no net significant effect on the atmospheric CO2 given the terrestrial and ocean productivity and respiration should largely account for C in food which humans eat. On the lost of C sinks, I find the decision to associate it to the human metabolism arbitrary, and not appropriate given they are fundamentally different processes (although interconnected as many processes in the C cycle).

Given the authors do not provide a calculation of the loss C sink capacity and the fact I think it would be inappropriate to lump it together with the human metabolism flux, I suggest justifying the paper on the basis of improved understanding of the quantities and attribution of fluxes in the global carbon cycle (and ways to manage it), and not on the basis of having found a missing flux which is responsible for underestimating the future atmospheric CO2 (which I believe is not correct).

The lost of C sink capacity is a very important issue which certainly deserves much attention but I found it a different issue altogether from the central topic of the paper. The authors may choose to show the importance of the issue by citing some of the estimates already provided by Gitz and Ciais (2004) in Climatic Change and other papers by the same authors. But I would not use it as a justification of the importance of human/livestock metabolic respiration.

In summary, this is an important and elegant contribution to better understanding the global carbon cycle, its controls and quantities, very worth publishing in Biogeo-

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sciences.

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