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Biogeosciences Discussions

Interactive comment on "Peatlands and the carbon cycle: from local processes to global implications – a synthesis" *by* J. Limpens et al.

Anonymous Referee #3

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General comments

I found this paper very informative and important. If had students studying peatland carbon cycling or greenhouse effect associated with land use in general, I would use material from this article in teaching. Even as a result of symposium, where scientist meet by change, it covers fairly well peatland ecosystems and is increasing (or keeping) the role of peatlands in greenhouse gas effect and carbon balance important. This is important in current situation, when 'peatlands are not explicitly included in global climate models and therefore in predictions of future climate change (IPCC, 2007)'; as authors point out.

I like the way how carbon degradation in waterlogged systems is introduced. Article is

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not only concentrating to CO2 and CH4 but also dissolved organic carbon is included and role of alternative electron acceptors in addition to oxygen is also clearly expressed in text. Even lack of oxygen leads to CH4 fluxes and carbon storage in peatlands, including sulphur cycle as a part of carbon cycle is similarly important. Authors also are also keeping in mind that proceses of peatlands may be changing as they may be destabilized by global warming and changes in land use, and affect then also their surroundings. Article is also well organized according to important aspects in peatland atmosphere interactions.

Specific comments

The article is delineated so that arctic tundra is not included, even subarctic wetlands are. This delineation is probably OK with large scale estimates, but for small scale processes the same factors as driving forces are important. So this delineation is somewhat artificial.

There is some points, which may need some additional comments and references in order to give a clearer picture of the whole peatland processes. Even the aim of the article is to synthesize the main findings of the symposium, I feel that article benefits from a bit wider scale of peatland knowledge. As the title is 'Peatlands and the carbon cycle: from local processes to global implications - a synthesis'

It might be helpful to reader to explain the terms ombrotrophy and minerotrophy, as water source largely determines the functions on peatlands and ties peatlands to hydrology of surrounding areas, and is also included in 'ways forward' as one goal to determine from peatlands.

There is no estimate of areas of peatlands in general or in their different uses, except of this 3% of land surface'. By this way a reader not familiar with peatlands will get lost. I am sure that peatland restoration mentioned here is only a minor player in carbon balance, CH4 and POC fluxes compared to peatland usage to agriculture, forestry, peat harvesting and as water reservoirs.

BGD

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I do not understand the function of natural peatland pipe (figure 3); or then I have never seen one, and see it only as a rare exception.

Interactive comment on Biogeosciences Discuss., 5, 1379, 2008.