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Interactive comment on "Shifting environmental controls on CH_4 fluxes in a sub-boreal peatland" *by* T. G. Pypker et al.

Anonymous Referee #1

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In "Shifting environmental controls on CHÂň4fluxes in a sub-boreal peatland", Pypker et al. has investigated the biotic and abiotic drivers on CO2 and CH4ÂňÂň fluxes in a northern Michigan peatland. Though a research question was not specifically stated, the objectives of this study were to quantify CH4 flux and determine which abiotic and biotic factors were the most correlated to CH4 flux. I believe that this is an essential part in beginning to understand the consequences of further climatic changes on peatlands. The authors utilized an eddy covariance tower to make continuous growing season measurements of trace gas fluxes and soil hydroclimate, which I feel is a novel approach toward understanding trace gas fluxes on both diurnal and seasonal scales and thus merits publication. I have broken my general comments into sections here as well as made in line comments on the attached pdf.

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Interactive Discussion
Discussion Paper

Abstract: The abstract seemed results heavy. Perhaps report your most 'important' results and add a line or two introducing us to your topic and concluding with proposed further research to tie it all together. Introduction: The literature review was strong, but I feel it could benefit from the addition of several more recent citation, which would place this paper in the context of the current state of this research Methods: The explanation of eddy covariance methods was very thorough and easy to understand for someone who is not an expert in eddy towers. It might be helpful to see the equation used to calculate flux so that the reader can better understand the units. Results/Discussion Section 4.3 Substrate quality: how does the formation of this landscape differ from the rest of sub-boreal peatlands in northern Michigan? Do these peatlands vary across northern Michigan in time since deposition or climate which may have an influence on decomposition and thus trace gas flux? Substantial conclusions were reached in this paper, though I would like to know how this study can be expanded in order to gain a better understanding of this landscape. Providing something constructive regarding improvements/future research would improve the paper. Is this study representative of all of the sub-boreal peatlands? It might be good to mention about the limited scope of reference or discussion of how this study may be different from other studies in the region.

Please also note the supplement to this comment:
http://www.biogeosciences-discuss.net/10/C4522/2013/bgd-10-C4522-2013-supplement.pdf

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