

Interactive comment on “Response of CH₄ emission to moss removal and N addition in boreal peatland of Northeast China” by H. N. Meng et al.

Anonymous Referee #2

Received and published: 22 June 2014

Comments on “Response of methane emission to moss removal and N addition in boreal peatland of Northeast China” by H. N. Meng et al.

The effects of nitrogen on marsh methane emission are understood less than those of other environmental variables, such as moisture and temperature. Till today, still no single consensus exists on impacts of nitrogen load/addition/ amendment/deposition on methane emissions in the wetlands soils. It is a valuable research topic. This paper measured methane emission over three growing seasons in a boreal peatland plots by adding urea twice per year and removing the tops of plant Sphagnum by clipping in northern China. The results present a set of valuable data. It is an interesting paper. My general feeling is that this paper can be accepted after minor revisions for publication in Biogeosciences.

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Detailed comments: 1. In 2.1 study site, the amount of nitrogen deposition or nitrogen load (including urea fertilizer load) in the study area should be stated, and the height and coverage of the dominant species should be given. 2. P3372 L 12-13: the result and conclusion of “Across the three growing seasons, methane flux decreased linearly with increased soil temperatures ($p < 0.05$, Fig. 4a)” should be cautious, although the P value < 0.05 , the R² is very low. 3. Fig. 5. “Spatial dependence of seasonal mean CH₄ flux and soil temperature”, I don’t know what is the meaning of “Spatial dependence”, it seems not correspond to the contents of Fig.5. 4. Whether can give some data of the water level above ground in the three years, especially in 2013? And discuss the effects of rainfall and water level above ground on methane emission. 5. Whether can give some data of the re-growth of the plants after cutting? 6. At present, the N addition included nitrate, ammonium, ammonium nitrate, ammonia and urea, and the results were not identical, the effects of nitrogen addition on the methane flux in natural wetlands have positive, negative and ineffective patterns, which may be due to different nitrogen form, dose, input levels and frequency, physical and chemical properties of soil, microbial activity, environmental factors, redox potential and so on. I think that the author should have a more deeper discussion on the reasons of their result, including compared with other reports on the effects of urea load on the methane in natural marshes in temperature zone, in different environmental condition, the mineralization rate of urea may be different, and finally affects the effects of urea load on methane production and oxidation, I think the author can give some more convincing explanations on their results.

Interactive comment on Biogeosciences Discuss., 11, 3365, 2014.

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