

Revision of bg-2016-238 (January 2017)

Referee report on the revised version of the manuscript bg-2016-238
4 Dec 2016

GENERAL COMMENTS

The manuscript has been very carefully revised according to the suggestions of the both referees, and it has been significantly improved: It is now well focused, reads fluently and has all the necessary details for understanding how the different phases of the work were conducted.

I have no suggestions for corrections, despite the technical corrections listed below, and am pleased to recommend this work for publication in Biogeosciences.

AUTHORS REPLY: We wish to thank the reviewer for the very detailed review of our manuscript and spotting the inconsistencies, typos etc. We have corrected ALL changes as suggested (see track changes in [bg-2016-238-text-version1.docx](#)). We have only inserted an AUTHOR REPLY where significant changes to the text had to be made.

TECHNICAL CORRECTIONS

Page 2, line 6: The verb is missing in ‘...boreal forests are known to significant stocks of organic N...’

AUTHORS REPLY: corrected and included the verb ‘be’

Page 2, line 26: Add comma after ‘forest sites’

AUTHORS REPLY: corrected

Page 3, lines 27-30: Complicated sentence, consider revising. Please check also the spelling of the words ‘aerenchyma’ and ‘potential’.

AUTHORS REPLY: We have rephrased this sentence to:

As CH₄, also N₂O production is a microbial process. The main drivers regulating N₂O production are nitrogen, such as ammonium and nitrate, temperature and factors which regulate the ratio of aerobic to anaerobic soil microsites, such as soil moisture (Butterbach-Bahl et al., 2013). In peatlands transport through aerenchyma, is also for N₂O a potential transport mechanism.

Page 4, line 25: Space missing after the full stop.

AUTHORS REPLY: corrected

Page 6, line 20: Comma is not needed after the parenthesis.

AUTHORS REPLY: corrected

Page 13, line 16: In my opinion, a comma would be a more appropriate separator between the sentences than a full stop.

AUTHORS REPLY: corrected

Page 14, line 8: Letter t missing in Turetsky.

AUTHORS REPLY: corrected

Page 15, line 4: The full word methane should be used instead of the chemical formula in the beginning of the sentence.

AUTHORS REPLY: corrected

Page 15, line 10: An extra full stop in the end.

AUTHORS REPLY: corrected

Page 15, line 19: Please check the correct quoting of Marushchak et al., 2011. The paper do not report large N₂O fluxes at permafrost thaw, but from bare peat on peatlands currently elevated by permafrost, where erosion and frost action keep the surfaces bare of vegetation.

AUTHORS REPLY: Deleted Marushchak et al, as this reference is not appropriate

References: Please check the use of subscript/superscript letters throughout the reference list!

AUTHORS REPLY: corrected

Page 18, line 5 & Page 19, line 20: The links seem to be to the supplementary information, is this intentional?

AUTHORS REPLY: Yes, this is intentional. To clarify we have changed this by inserting 'and' in both cases, i.e.:

Geosci, 3, 617-621 and

http://www.nature.com/ngeo/journal/v3/n9/supinfo/ngeo939_S1.html, 2010.

Page 19, line 27: A typing error in the name of the last author.

AUTHORS REPLY: corrected

Page 20, lines 12-14: Unnecessary capital letters.

AUTHORS REPLY: this reference has been removed

Page 21, lines 14-15: The formatting of the author names differs from the other references.

AUTHORS REPLY: corrected

Page 22, line 1: The author surnames are Tan and Zhuang, please correct the reference.

AUTHORS REPLY: corrected in the reference list and test p15 line 5.

AUTHORS COMMENT: In addition we spotted a few other small errors and have indicated changes (see the track changed version of the manuscript [bg-2016-238-text-version1.docx](#)).