



Interactive comment on “Contribution of the nongrowing season to annual N₂O emissions from the continuous permafrost region in Northeast China” by Weifeng Gao et al.

Weifeng Gao et al.

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Dear Referee:

After receive your comments, we revised the manuscript as soon as possible. And submitted the reply letter on the official website of Biogeosciences. However, we revised the manuscript again based on the Dr. Lutz's comments. Therefore, the line numbering in the reply letter were different with final version of the manuscript. We have corrected the line numbering. The specific amendments are as follows:

General comments

C1

1. This MS evaluates the contribution of nongrowing season to annual N₂O emissions, but during the winter period, N₂O emission was not measured for almost the entire period from December to February. Although the authors state that winter period is longer than soil thawing period and therefore has more cumulative N₂O emission (L482-490), there are no measurements that adequately cover this period. By linear interpolation, it is estimated that N₂O emission continues to occur during this unmeasured period (Figure 1). However, could significant N₂O emission occur during soil freezing? The authors should clearly explain the question of the legitimacy of the integrated release estimate caused by the lack of frequency of measurements.

The authors' answer:

The line numbering should be 455-471.

Specific comments

1. L120-129: It is described as a “permafrost region”, but there is almost no information about permafrost (e.g., thickness of permafrost layer, active layer depth, soil thawing period, etc.)

The authors' answer:

The line numbering should be 132-135.

5. L310-334: Soil C/N, TOC, and TN have been shown to be controlling factors for the temporal variations of N₂O emissions, but do these values change over time like N₂O emissions?

The authors' answer:

The line numbering should be 258-271.

7. In addition, the seasonal changes in environmental factors are not shown, so it is difficult to judge the correlation. L403-412: I think it should be shown in the results.

C2

The authors' answer:

The line numbering should be 240-285.

Thank you for your comments; we are happy to make additional revisions if needed.

Sincerely,

The authors,

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