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# *Interactive comment on* "Impacts of prescribed burning on soil greenhouse gas fluxes in a suburban native forest of south-eastern Queensland, Australia" *by* Y. Zhao et al.

**Y. Zhao et al.**

yanzhao.cas@gmail.com

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We appreciate the referee #1's professional comments which helped us to improve our manuscript. According to the comments we modified the manuscript as detailed below.

Referee #1's comments 1: "Most perplexing, since quite unusual in context of the large amount of publication on methods used to quantify soil greenhouse gas (GHG) exchange in forest ecosystems, in the presented manuscript one site is synonym with one soil flux chamber. In general at least 5-10 chambers per site are necessary to capture spatial variation in soil CO2, CH4 and to a lesser degree N2O exchange. . . ."

Authors' response - The referee highlighted the difference between "site" and "plot"



which we did not treat carefully when preparing the MS. What we want to demonstrate is: we conducted this study at the burned site with four replicate plots. We considered the stand conditions (eucalypt forest with moderate density), location (middle slope) to ensure the similarity of the four selected plots. To avoid any misunderstanding, we changed the term of "site" into "plot" throughout the article.

Referee #1's comments 2: "Another problem is the type of statistical analysis used. . ."

Authors' response - we appreciate the referee's comments based on his/her professional knowledge. In the submitted MS, we did not give enough details about our statistical methods. What's more, we should not mention it as "repeated measures ANOVA" while we actually used the "one way ANOVA" method (this is described in the caption of Table 1). Specifically, one-way ANOVA was applied to compare gas fluxes in the burned plots before and after the burning, and also applied to compare fluxes between the burned and unburned plots (the 4 additional selected plots) in Aug and Nov 2014, respectively. Therefore, we did not treat the 4 unburned plots located in green islands as pre-burning conditions, and these plots were only taken as additional reference plots to discuss the impacts of burning. To clarify this point, we modified the section "2.5 Statistical analysis" as detailed below:

"All statistical analyses were performed using IBM SPSS STATISTICS (version 20) software. One-way ANOVA was introduced to examine statistically significant differences between soil gas fluxes measured before and after the burning in the burned plots. This analysis was also applied to compare the fluxes between burned and unburned plots in Aug 2014 and Nov 2014, respectively. Correlation analysis was tested for possible effects of soil environmental variables on soil CO2, CH4 and N2O fluxes."

Referee #1's comments 3: "no data were collected in the first 2-3 months directly after the burn, . . ., there are no data presented to put the measuring campaigns into a climatic context. . ."

Authors' response - we understand the referee's concerns of higher sampling fre-

quency during the first several months after burning. Our first sampling after burning was carried out on 27 Aug 2014, which was actually within 3 months after the burning (27 Aug 2014). We did not conduct earlier samplings after burning due to accessibility of the plots. Meanwhile, the sampling dates in Aug 2013 and Aug 2014 were intended to minimize the impacts of changes in climate conditions based on a primary assumption that temperature, radiation and precipitation would not change much for the same periods of a year in this study.

Referee #1's comments 4: "manuscript would also need to be edited by a native English speaker and will need to be completely rewritten in plain English. . ."

Authors' response - Prof. Zhihong Xu has carefully gone through the paper and revised the English expressions substantially. Prof. Xu has been working and studying in Australia for about 30 years, and he is also an Editor-in-Chief or Editor of major international journals.

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Interactive comment on Biogeosciences Discuss., 12, 10679, 2015.