Biogeosciences Discuss., 12, C5940–C5943, 2015
www.biogeosciences-discuss.net/12/C5940/2015/

Biogeosciences
Discussions
Open Access

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

Received and published: 30 September 2015

Referee #1's additional comments 1: At no stage is discussed if there might have been runoff mediated lateral flow of nutrients or ash from burnt to unburnt areas in the 1 year timeframe after the burn

Author's response: we have included the weather data in Table 1 and the antecedent precipitation should able to partly address this point. There were only limited small precipitation events (always less than 3 mm) either 30 days or 90 days before the sampling events, especially for the one on Aug 2014. This weather condition made it less likely that nutrient or ashes in burned areas had transferred to unburned areas by

runoff.

Referee #1's additional comments 2: An coefficient of variance analyses that would indicate how spatially variable soil GHG fluxes and other variables for each measuring date are is missing

Authors' response: we plotted the mean fluxes with standard deviations as error bars in figure 1 to show the variance among the 4 plots of the 4 sampling days during each sampling period. Mean $\pm$ std also listed in table 1 and 2 to address the variance. To specify this point, we accepted the referee's comments and calculated the CVs in the "Result" section, the sentences are also listed below:

"...Coefficient of variance (CV, ratio of the standard deviation to the mean) among the plots during the 4 sampling days ranged from 14%-68% (mean 32%), 9%-15% (mean 10%) and 10%-28% (mean 16%), for Aug 2013, Aug 2014 and Nov 2014, respectively. ..." "Soil CO2 flux showed relative higher variance as indicated by the higher standard deviations (Figure 2) and CVs (ranged from 43% to 50% during the three sampling periods). ..."

Referee #1's additional comments 3: The data have not been put into any climatic context – please provide weather data (precipitation, air temp, RH) for the study period and put this in context with your soil moisture and temperature measurements

Authors' response: we accept the referee's comments and added the weather data in table 1. Please turn to the attached copy of the revised ms for details.

Referee #1's additional comments 4: Please provide soil bulk density and particle size analysis data for the study plots

Authors' response: we did not measure bulk density in the plots however the soils in the region were relatively homogeneous with some gravels and small stones.

Referee #1's additional comments 5: For anyone to make an informed decision if your spatial replication was sufficient please provide the raw data of your GHG measure-

ments

Authors' response: we have presented our GHG measurements of every single day in Figure 2. The mean and std values calculated should partially reflect the spatial replications.

Referee #1's additional comments 6: Please provide information what type of regression analysis you have used and provide adjusted R2 values instead of R values. Also please reconsider if 3 data points are enough to do this type of analysis and if you meet the underlying assumptions of the test used

Authors' response: Pearson correlation analysis was applied to detect any potential driving factors on soil greenhouse gas emission. All measured soil properties and gas fluxes at the 4 replicate plots during the three sampling events were pooled together for this analysis. We clarified this point in the statistical analysis section, as described below:

"Collected soil properties and gas fluxes at the four replicate plots during the three sampling events were also pooled together for Pearson correlation analysis to detect possible effects of soil environmental variables on soil CO2, CH4 and N2O fluxes."

Referee #1's additional comments 7: Some of the references are not up to date and some of the newer literature on wildfire or prescribed burning effects on soil GHG fluxes in eucalypt fluxes is missing

Author' response: we updated the reference list with a recent published paper about planned burning on temperate eucalypt forest system.

"Fest, B. J., Livesley, S. J., Fischer, J. C., and Arnadt, S. K. Repeated fuel reduction burns have little long-term impact on soil greenhouse gas exchange in a dry sclerophyll eucalypt forest. Agr Forest Meteorol, 201, 17-25, 2015."

Please also note the supplement to this comment:

http://www.biogeosciences-discuss.net/12/C5940/2015/bgd-12-C5940-2015-supplement.pdf

---

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