Biogeosciences Discuss., 12, C9327–C9329, 2016
www.biogeosciences-discuss.net/12/C9327/2016/

Biogeosciences Discussions
Open Access
EGU

Interactive comment on "Effect of sporadic destratification, seasonal overturn and artificial mixing on CH_4 emissions at the surface of a subtropical hydroelectric reservoir (Nam Theun 2 Reservoir, Lao PDR)" *by* F. Guérin et al.

F. Guérin et al.

frederic.guerin@ird.fr

Received and published: 21 January 2016

The authors thanks the reviewer for his positive comments on the manuscript

R#3 comment :"I still have some minor concern about the MS in its discussion section. Firstly, authors did not compare their results comprehensively with other studies all over the world. E.g., the diffusive emission from the surface was high or low? Did your results were fallen in the range of emission rates from other studies? The possible reason?"

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

Answer : At the beginning of the section 4.4, we added a few lines where we compared emissions from the NT2 Reservoir with some other reservoirs in the tropics as follow : "Yearly integrated at the whole reservoir surface, these emissions correspond to diffusive fluxes of 1.5 to 4 mmol m-2 d-1. These emissions are significantly lower than diffusive fluxes measured at the Petit Saut Reservoir during the first two years after flooding but similar to those determined in the following years (Abril et al., 2005) and values reported for diffusive fluxes from tropical reservoirs in Barros et al. (2011). In absence of the extreme emissions (both hotspots and hot moments), diffusive emissions from NT2R would have been one order of magnitude lower than emissions from tropical reservoirs as expected from the lower flooded biomass compare to Amazonian reservoirs (Descloux et al., 2011). Due to the specific dynamic of diffusive fluxes at NT2R, diffusion at the reservoir surface contribute 18 to 27% of total emissions (Table 3) that is significantly higher than at other reservoirs tropical reservoirs where it was measured (See Deshmukh et al., 2015 for a detailed discussion)".

R#3 "Secondly, for the hotspots, as we know, turbine and water-logged drawdown areas are regarded as the hotspots of hydroelectric reservoirs. Please give some comparisons with their contribution to the total emission with inflow waters' and highlight how important about this hotspot from the inflow water."

Answer : In order to fulfil the reviewer comment we added the table 3 and the section 4.4 was slightly modified as follow : " Although the area under the influence of the water intake is less than 1% of the total area of the reservoir, emissions at the water intake contributed between 13 and 25% of total diffusive emissions and 4 to 10 % if considering both ebullition and diffusion (Table 3). It is worth to note that emissions at this site are only significant within 3-5 month per year at the end of the WD season-beginning of the WW season when the storage of CH4 reach its maximum in the reservoir (Figure 8b). This new hotspot equals 20 to 40% of downstream emissions and contributes between 4 and 7% of total emissions from the NT2 reservoir surface when including ebullition and downstream emissions (Table 3 and Deshmukh et al. (2015))."

BGD
12, C9327–C9329, 2016

We also determined emissions from the drawdown area during this study but they are not included in the new table. The results are reported in another manuscript under review. Basically, despite a very large surface area the emissions from the drawdown area are less than 3% of the total emissions from this reservoir.

Interactive comment on Biogeosciences Discuss., 12, 11349, 2015.