

## ***Interactive comment on “Rooting and plant density strongly determine greenhouse gas budget of water hyacinth (*Eichhornia crassipes*) mats” by Ernandes Sobreira Oliveira Junior et al.***

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We would like to thank the Referee 2 for her/his comments and suggestions. Please find our itemized list of responses below, as well as our revised manuscript.

Our responses are structured as follows: (1) comments from referees/public, (2) author's response, and (3) author's changes in manuscript indicating the page and line of the changes when applicable.

1) The manuscript by Oliveira Jr et al., titled “Rooting and plant density strongly determine greenhouse gas budget of water hyacinth (*Eichhornia crassipes*) mats”, also shows relevant data on the contribution of the species to the N and P cyclization. How-

C1

ever, these aspects are not adequately stressed and introduced in the Title and the Introduction section. The term “nutrient dynamics” is introduced for the first time in the introduction (line 15, pag. 2), without any specific reference in the experimental hypotheses. I believe that these aspects need for proper presentation, as well as the need to be put in relation with the metabolism of C.

2) Thank you for your special interest in nutrient dynamics next to C dynamics. The nutrient dynamics were included in the paper in order to link plant growth – which is strongly related to nutrient uptake - to greenhouse gas fluxes. This relationship is addressed mainly in the section 4.2. We fully agree that the nutrient dynamics should be mentioned in a specific hypothesis, and therefore now included this hypothesis: “Sediment nutrient uptake by the roots will lead to lower pore-water nutrient concentrations and lower C:N and C:P ratios in newly formed biomass.” (page 6 lines 6-9). We explicitly refute this hypothesis in page 15 line 15 of the manuscript.

3) Page 6 line 6-9.

1) Minor comments: Line 2, p. 4; I believe that the repetition “Reddy, Agami & Tucker,” is not necessary; Line 17, p. 4;

2) The first paper focusses on nitrogen supply, whereas the second paper focusses on phosphorus. Both studies show the effect of nutrient availability on the growth of water hyacinth. We therefore decided to keep both references.

1) I believe that the quote “Bastviken, 2009” is not adequate to introduce the chimney effect mechanism. Many other papers have specifically considered the methane release mechanisms by rooted macrophytes; see for example Hamilton et al., 2014 – Inland Waters (an interest reference also for the role of the water depth in driving the methane release – see lines 6-7, p. 11); Laanbroek, 2010 – Annals of Botany.

2) Thank you for the literature suggestions. We now included the main findings of these papers – which match ours – in the manuscript.

C2

3) Page 14 lines 13-15; page 4 lines 19-22.

1) Line 13, p. 5; "l x w x h" not clear; Line 15, p. 5; . . .38.91"L; what does it mean "L"?

2) "l x w x h" was changed to "length x width x height", and the letter "L" in the coordinates was corrected to "E" (East).

3) Page 6 line 15; page 6 line 17.

Please also note the supplement to this comment:

<http://www.biogeosciences-discuss.net/bg-2016-297/bg-2016-297-AC7-supplement.pdf>

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