

## ***Interactive comment on “Natural events of anoxia and low respiration index in oligotrophic lakes of the Atlantic Tropical Forest” by H. Marotta et al.***

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Point-by-point response to the reviews and the list of all relevant changes made in the manuscript “Natural events of anoxia and low respiration index in oligotrophic lakes of the Atlantic Tropical Forest ” authored by H. Marotta, M. L. S. Fontes, and M. M. Petrucio

Dear Editor,

I would like to submit the revised version of this manuscript after valuable contributions in Biogeosciences Discussions to be considered for publication in Biogeosciences. We greatly appreciate the valuable comments and suggestions received from the two anonymous reviewers. Here, we described below our actions in order to address rec-

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ommendations by the Referee #2.

Sincerely,

Humberto Marotta

Actions taken in response to the comments by the Referee # 2

Referee #2 “I would suggest consistent use of either molar or mass units” Comment: We agree. Action: We converted molar units of carbon to mass units in the overall manuscript.

Referee #2 (p. 4228, around line 6) “reference needed for Koppen classification” Comment: We agree. Action: We updated the reference and the text now reads: “The climate of the study area is tropical wet and dry (Koppen climate classification Aw; Peel et al., 2007), characterized by a strong seasonality in rainfall (Metzker et al., 2011).”

Referee #2 (pag 4229, lines 17-23) “Timing of sampling makes me wonder what happens at night. (. . .). I am wondering whether you have any measurements between 6 pm and 6 am. It would be useful to indicate to the reader what might be happening during that period.” Comment: We agree but, unfortunately, we had not sampled between 6 p.m. and 6 a.m. Action: We clarified that there are not any data between 6 p.m. and 6 a.m in our study. The text now reads “Additionally, one daily variation in O<sub>2</sub>, pH, alkalinity and temperature without any nocturnal data (time of sampling at 12:00 p.m., 6:00 p.m., 6:00 a.m. and 12:00 p.m. the day after) was simultaneously assessed in three periods”

Referee #2 (pag 4230, paragraph 2) “Did you make any direct measurements of CO<sub>2</sub>? My feeling has long been that Stumm and Morgan calculations must be correct but some of the parallel analyses we have run suggest otherwise. By this I am not casting doubt on you conclusions but it might be useful to reassure the reader that direct measurements yield results that are similar to the calculated numbers” Comment: We agree but we do not have any direct measurements of CO<sub>2</sub>. Action: –

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Referee #2 (pag 4231, paragraph 2) "Could you do some overall analysis showing that gas fluxes differed significantly between stratified and unstratified periods? I know you statistical suggest this graphically, but it would be interesting to see a more powerful global analysis" Comment: We agree. Action: Analysis of variance (ANOVA) was conducted for gas fluxes between stratified and unstratified periods for both lakes, but no significant differences were observed. Now the text reads at page 8 line 2 "In addition, non-significant differences were observed for CO<sub>2</sub> air-water fluxes between stratified and unstratified periods in both lakes (Paired t-test,  $p > 0.05$ )."

Referee #2 (pag 4232, line 4) "Can't you get a negative number in a spreadsheet calculation either by low oxygen or low CO<sub>2</sub>? So doesn't this become difficult to interpret?" Comment: We agree in highlighting what negative values of respiration index might indicate. The negative numbers are from pO<sub>2</sub>/pCO<sub>2</sub> ratios lower than 1.0, as the respiration index is in log base 10 following Brewer and Peltzer (2009). These negative values indicate extremely low values of pO<sub>2</sub> in waters. Action: The now reads at the end of the analytical methods "Negative values of RI (RI < 0) indicate a ratio pO<sub>2</sub>:pCO<sub>2</sub> < 1.0."

Referee #2 (p 4233. line 3) "Are the emission rates of CO<sub>2</sub> large or small with respect to other aquatic and terrestrial systems? Some comparative analysis would be interesting here." Comment: We agree. Action: The text now reads "Assuming the conservative wind velocity of 0.5 m s<sup>-1</sup> applied in other studies (Colet et al 1994), the average CO<sub>2</sub> efflux estimated for lakes Aguapé and Barra was about 1.5 mmol C m<sup>-2</sup> h<sup>-1</sup>, comparable to that high average reported in a review for tropical lakes using the same approach (1.7 mmol m<sup>-2</sup> h<sup>-1</sup>; Marotta et al 2009)."

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Interactive comment on Biogeosciences Discuss., 9, 4225, 2012.