

Interactive comment on “Rhizosphere to the atmosphere: contrasting methane pathways, fluxes and geochemical drivers across the terrestrial-aquatic wetland boundary” by Luke C. Jeffrey et al.

Anonymous Referee #2

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I apologize for the delay in getting my review in. Overall I think this study is interesting and the paper is mostly well written. It is unfortunate that it is just 2 seasonal sampling events. It is unclear if the sampling occurred over more than one day each season? Please clarify. The authors do a good job of limiting their results to what they can say with the data at hand (assuming that they sampled more than one day per season). I do think that some things need to be clarified. Below I provide comments and suggestions of issues that need to be clarified.

Lines 35 and 36- negative relationships between Fe, and SO₄, and CH₄? Or Fe and C₁

CH₄, and SO₄ and CH₄? The wording is unclear.

Line 46- what do you mean by early system recovery periods? Recovery from what? Was this wetland recovering from something? This was a remediated wetland?

Line 59- how are drivers and effects of seasonal weather oscillations different?

Line 62- See problems with Mitsch et al 2013 calculations from Bridgman et al 2014 and Neubauer 2014 papers. I see you cite those papers.

Line 68- “lack of spatially resolved wetland CH₄ emission data”? There are many studies that have measured this. Some of which you already cited.

Line 84- Is Lal 2008 an appropriate citation for this sentence?

Line 92-how was that 1.2 Pg C estimated?

Line 112- why do you expect the fluxes going to differ across the wetland communities?

Line 162-163- Why were those fluxes reported elsewhere? Is that paper available?

Line 164- how many chambers did you have in each vegetation type? How many days did you measure fluxes? Was it only one day each season?

Lines 279-281- This sentence is more Discussion.

Line 302- Structuring the Discussion in the same order as the Results makes it easier for the reader. I suggest you Discuss your results in the same order they were presented in the Results section.

Line 326-CASS wetland restoration the same as remediation?

Lines 345 and 346- It gets hard to keep track of C₁, C₂, Veg A, Veg B. Could there be more straightforward ways of talking about these?

Line 352-354- This is more of a results sentence and I am not sure I understand what you are saying. Please clarify.

Line 409 and 410- this Veg A and B is getting tiring. Why not just talk about the species?

Line 433- it is hard for readers to access submitted papers. Please do not cite papers that are not already published in some form.

Line 467- Again see Bridgham et al. 2014 about the problems with Mitsch et al use of radiative forcing vs balance.

Line 452, comma between budget and however.

Figure 6- those are really low r^2 values! Are these significant relationships? If they are not significant, it is better not to report the value. And r^2 of 0.0005 is better to just say there was no relationship.

Figure 8- I really like this figure. Is Fe(III) in Veg C above the axis break? It is a little hard to tell.

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