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Peer Review File

Modeling Phosphorus Retention and Release in Riparian Wetlands Restored on Historically Farmed Land

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Marc Beutel, Co-Editor in Chief, University of California, Merced

Mauricio E. Arias, Associate Editor, University of South Florida

Reviewers
David Austin, Jacobs Engineering Group

W. Cully Hession, Virginia Tech

Response to Reviewers

(Responses are indented and in blue text)

We have revised the manuscript and responded to all relevant comments from the editor and the reviewer. The primary concern with the paper was the length. We have made substantial cuts to the original manuscript. However, we still exceed suggested limits for word count (by ~900 words) and figures/tables (by 3 elements). We think that we cannot reduce the article much further without substantially altering the overall content and depth of the paper (with which the reviewers were so pleased).

We understand that the limits on manuscript length and the number figures/tables help keep production time to a manageable duration. However, given positive feedback from the reviewers and the unique scope of our combined field and modeling study, we ask the editors to make some minor exceptions to the word count and figure/table limits for our case. See our responses to specific comments below.

Comments from the Production Editor (Aimee Diehl)
and Associate Editor (Mauricio E. Arias):

The manuscript exceeds the recommended 6,000-word limit by at least 3,000 words. This will result in a much longer production time, both for copyediting and PDF/online formats. I understand it is very difficult to leave any precious piece out of this nice manuscript, but the authors are in the best position to choose what that might be. For starters, the site descriptions and the figure captions can definitely be shortened.

We have reduced the word count by ~3060 words, from 9948 to 6890 (including main article text, headings, tables, and figure legends). The bulk of revisions are focused on the methods and discussion, both of which have been reorganized with new section headings. Some minor cuts have also been made to the results. We have moved material to the Supplemental Materials document and reorganized it into four sections to accommodate these changes.

The manuscript appears to use CSE style correctly. See separate note below about the supplementary material.

The manuscript has 10 figures/photos, some with multiple components, and 3 tables (4 if you count "Box 1"). This total of 13 (14?) exceeds our recommended number of 8 per manuscript. Many of the figures are quite detailed. Each of these items requires special treatment and additional time in production.

We removed four figures/tables/boxes from the main article, bringing the count to 11 (including the site photo). "Table 1" has been deleted. Box 1 has been moved to Supplementary Material and is now called "Box S1". We also moved "Figure 3" and "Table 3" to the Supplementary Materials – they are now respectively called "Figure S13" and "Table S2". Captions and cross references to figures and tables have been updated to account for these changes.

The supplementary material uses CSE inconsistently within the text and the formatting of many end references is incorrect. Please note that I do not proofread, copy edit, or adjust supplementary material; it is placed into a formatted template directly from the PDF provided by the authors.

> *We have reviewed the Supplemental Materials and made corrections where CSE was not used.*

The supplementary material contains a significant number of graphic elements (21 figures and 9 tables), some of which may not be readable at such small dimensions when transferred to the PDF template. Some examples of figures with very small type include S9, S10, S11, and S13.

> *We increased the font size and/or removed small font elements of the supplemental figures mentioned above.*

The supplementary material is 45 pages long and will also require additional time in production.

> *The Supplemental Materials document provides information that is necessary to replicate our methods. Given the unique scope of the combined field and modeling study, we think that the length is justified. We hope JEED's use of author-formatted PDF files for the supplementary materials reduces the work required by the Production Editor.*

Comments from Reviewer B (W. Cully Hession):

The manuscript has a word count equal to or fewer than 6,000 words (excluding the references list).

Disagree

> *We have reduced the word count by over 3000 words. See responses to editor above.*

Figures and tables are used appropriately to aid understanding. Text, color, and shading in figures and tables are accessible to readers of varying abilities (for example, chosen fonts and type sizes are easy to read, and combinations of red and green have been avoided). Sources of figures and tables are properly credited.

Mostly Agree

> *We have enlarged text in certain figures, see responses to editors' comments above.*

Reviewer summary to be shared with the author and editors:

Excellent manuscript and study overall. Perfect fit for JEED. I have some small edits here and there, but nothing major. The supplemental material is probably the most I've ever seen - so, I reviewed to be sure it had the things (mostly about modeling and field study) I was hoping to see and that it made sense with where it was cited in the main document, but did not do a thorough review of supplemental materials. Objectives are appropriate and clearly stated, methodology is sound, and you did an excellent job of using the modeling to allow you to

extrapolate from 3 sites to a more regional/global context. You will likely have reviewers who will say 3 sites (n=3) is not enough, but I know this type of research is extremely time-consuming, expensive, and just hard - don't listen to them, you've used the model and some previous research nicely to take it beyond those 3 sites. If there is room, I'd love to see photos of all 3 sites at the beginning.*[Associate Editor note: No need to add more photos]*

> *We thank Reviewer 1 for their efforts to review this manuscript and appreciate the positive feedback.*

Detailed reviewer notes to be shared with the author and editors:

Some detailed comments below, but I've also uploaded a pdf with my comments detailed in there.
overall - Word count is over 9000 and form suggests JEED is looking for <6000. I'm okay with it being longer. [*Associate Editor note: You do need to shorten the manuscrip*]

> *We have reduced the word count to 6890 words. See responses to editor above.*

ln 21 - suggest you add "modeling" and "farmland" (or something similar) as key words.

> *We have added "farmland" to keywords, "modeling" is in the title.*

ln 89 - use SI like you do for the remainder of manuscript (if you want to put acres in ( ) that is fine.

> *SI units added.*

ln 115 - suggest spelling out P when it begins a sentence.

> *Changed*

ln 130 - most journals have a ; between a statement and a reference in a ( ) - but I'm not sure about JEED.

> *These instances occur several times throughout the manuscript. Does the production editor have any guidance here?*

ln 142 - change is to are.

> *Changed*

ln 147 - I don't think you need " " around wetlandP (or ' ' like you do on line 166)

> *Deleted " "*

ln 181 - great figure

> *Thanks!*

ln 213 - That is a really long list behind the ; - maybe include subroutines as a table?

> *The description of the subroutines are not critical to the paper. We moved this text to supplemental Text S1. Readers are referred to the online model and documentation.*

ln 256 - Check headers throughout main manuscript and supplemental for consistency. In main manuscript sometime you have a level all words capitalized, sometimes you don't.

> *Headers have been checked throughout the manuscript and supplemental. All headers are now in sentence case.*

ln 271 - low-intensity development

> *Revised*

ln 294 – suggest you include short description of earthen plug, not all readers will know what you are talking about.

We have revised the text in this sentence (see line 230). We now refer readers to the USDA NRCS national engineering handbook on wetland restoration (also on line 219).

ln 313 – Google Earth Pro shows the dates of the aerial imagery, I suggest you include those dates.

This text has been moved to supplemental Text S2. The dates are now included.

ln 323/324 – space between number and "m"

Checked and changed throughout manuscript.

ln 338 – "allowed"

This sentence has been deleted.

ln 342/343 – 24-hr

Checked and changed throughout manuscript.

ln 439 – example of inconsistent header

Headers have been checked throughout the manuscript.

ln 551 – suggest moving the "Flood Phase" legend somewhere else – above or below? It kind of gets lost over to the right…. same for Figure 4

The legend is now placed at the bottom.

ln 593 – space before "cm"

Checked and changed throughout manuscript.

ln 657-658 – Instead of saying "Panel "a" groups…." etc. you should just have a) Results grouped by study…." etc. like you do in other figures/caption.

Figure references have been shortened throughout the manuscript and checked for consistency.

ln 666/667 – Figure 7 - add a and b to figure boxes and add a)…. and b)…. to caption.

Figure labels have been added. Note that the figure numbering has changed.

ln 674/675 – Figure 8 – same as above a, b, c

Figure labels have been added. Note that the figure numbering has changed.

ln 748 – "foregone" isn't clear to me, spell out a bit

This line has been replaced. See replacement on line 561. "In riparian zones and floodplains where agriculture is economically viable, it is important to contextualize potential P gains or losses of wetland restoration relative to continued farming."

ln 766 – replace "to" with "of"

This sentence now reads (on line 548-550): "At Prindle Rd, we observed a reduction of DIP and an increase in DO from inflow to outflow (Figure 3), suggesting net DIP uptake by primary producers."

ln 769 – Took me a second to get my head straight on this “positive” – throughout most of manuscript you use retention vs balance… maybe put (net retention) after positive like you did later on line 789.

The sentence has been deleted.

ln 792/793 – great figure.

Thanks!

Comments from Reviewer C (David Austin):

The manuscript has a word count equal to or fewer than 6,000 words (excluding the references list).

Disagree

We have reduced the word count by over 3000 words. See comments above.

Reviewer summary to be shared with the author and editors:

Bravo! If the word limit were 10,000 words, I would say accept as is. No changes are needed.

However, it is too long. It has the sense of a Ph.D. dissertation trimmed into a paper.

Frankly, I would be loath to edit out any of it precisely because of the rigor of model description, methodology, and site description. Of course, it is precisely the model description, methodology, and site description where there is the most room to trim. I am not sure that there are 4,000 words to spare. Yet, out of 35 content pages, the discussion does not start until page 27, results start on page 20. My suggestion is to hold on to the results, discussion, and conclusion, and then rewrite to shift most of materials and methods to supplemental material. Alternatively, split the paper into a modeling methodology paper and the rest. The methodology paper could be a technical note published simultaneously.

We have revised the manuscript following the reviewer’s suggestions to substantially trim the methods and move key details to supplemental material. We have also reorganized and trimmed the discussion. See our response to comments below regarding splitting study into multiple papers.

Personally, I would prefer to see it kept all together. From an engineering design perspective, it flows as a “how-to-do-it-right” paper, with examples, for those engaging in P removal within the restoration wetland space. It is even useful to treatment marsh designers because large designs typically are in former agricultural areas. Soils absolutely need the analyses presented herein to get the P balance right. There is a “one-stop-shopping” attraction of this paper. Reviewers are not supposed to gush, so I won’t. That said, the authors have made it very easy for me to not only follow excellent research, but actually produce a document, which if published, that I would hand over to design engineers engaged in similar work with the instruction of “Do your analyses per Weigman et al.” Hence, you have my sympathies in trying to trim it down or splitting it into two papers. Both are hard work.

We appreciate the reviewers' sentiments here. Prior to submitting the paper to JEED, we drafted versions of this study that split the field study and modeling into two separate papers. We think that the combined field and modeling manuscript is much more useful to ecological engineers, compared to when the field and modeling components are presented separately.

This paper is a valuable addition to the literature. Although the topic of P retention/treatment in wetlands has a voluminous literature, which is well cited in the paper, there is much yet to do to aid design. This paper advances ecologically engineered practice.

Detailed reviewer notes to be shared with the author and editors:

I have no detailed notes. There is nothing to change if the word limit would allow it to be kept as is.

We thank Reviewer 2 for their efforts reviewing this manuscript and appreciate the positive feedback.