

## ***Interactive comment on “Bioturbation has a limited effect on phosphorus burial in salt marsh sediments” by Sebastiaan J. van de Velde et al.***

**Anonymous Referee #1**

Received and published: 8 December 2020

This is a well presented study that compares P burial and preservation in salt marsh ponds under oxygenated vs anoxic conditions. A nice aspect of this study is that major variables that are known to affect P deposition, such as sediment accumulation rate and organic matter composition, are very similar in the different ponds. Thus, the effect of other variables such as oxygen and bioturbation can be isolated. The paper is written in such a way that it appears a primary motivation for this work is to refute statements made in the paper by Boyle et al., 2014. From reading this paper it sounds like the Boyle paper did not consider many variables that can affect P cycling in sediments and made assumptions for modeling based solely on the presence or absence of bioturbation. Many other studies have considered the effects of many other variables but the way the abstract and text is written, a reader could get the incorrect impression that the

C1

assumptions in the Boyle paper reflect a general consensus about P cycling. In my opinion, it would be preferable to focus on the direct results of this nice study in the abstract and save the consideration of the Boyle assumptions along with other ideas on factors affecting P cycling in sediments for the introduction and discussion.

My main criticism of this manuscript is that the concluding sentences of the abstract are too broad. There are many caveats in extrapolating the results of this study to marine systems in general. The high sediment accumulation rates and organic matter composition set this environment apart from normal marine systems. Fortunately, these caveats, as well as other potential concerns, are discussed in the last paragraph of the manuscript. These caveats should be reflected in the abstract.

---

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2020-340>, 2020.

C2