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Biogeosciences Discussions

Interactive comment on "Agricultural induced impacts on soil carbon cycling and sequestration in a seasonally saturated wetland" *by* J. J. Maynard et al.

Anonymous Referee #1

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In this manuscript Maynard et al. aim to improve our understanding of the impact of sediment accumulation on C cycling in wetlands. I found this article generally well written and thought stimulating. The study nicely integrates different disciplines including geomorphology, biogeochemistry and soil science and is based on a wide, but highly complementary, range of observations and methodologies (suspended sediment, isotopic composition, geostatistics . . .). Overall, I don't have much problems with the gist of the paper but I encourage the authors to consider putting some more thought into a two key points, these focus upon (i) role of the age of the wetland (ii) management of wetlands to maximize C retention (ie spatially concentrated vs homogeneous sediment accumulation).

Page 6044 Lines 1-5: The correlation between NDVI and AGBM is very weak: The error on the predictions (eg average AGBM and C accumulation rates) should therefore be included in the estimates and the implications of this uncertainty for the interpretation should be discussed.

Page 6049 Line 15: The pattern seems to be controlled by the distance to the outlet and not the vegetation as suggested in the discussion? Please quantify the key controls on sediment and C deposition patterns.

Page 6053 Line 5: Is the increased NPP an assumption or an observation?

Page 6053 line 10: Please discuss why younger wetlands have higher retention efficiencies (deposition rates) and thus why the observed accumulation rates are substantially lower than the long-term average. This is an important finding as the age of the wetland will control the strength of the C sink? What are the implications of this for the US (average wetland age, etc and relate this to the estimates of US wetland area (line 1 page 6053)

Page 6054 Line 15-25: The conclusion that a more even sediment distribution will promote a higher C status doesn't fit with the earlier statement (line 15, same page) that higher rates of sedimentation limit OM decomposition. As this is one of the main conclusions of this paper (page 6055 line 20 Conclusion section), this should be carefully evaluated.

Interactive comment on Biogeosciences Discuss., 8, 6031, 2011.