

Interactive comment on “Carbon storage in seagrass soils: long-term nutrient history exceeds the effects of near-term nutrient enrichment” by A. R. Armitage and J. W. Fourqurean

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Thank you for your comments.

General comment 1. The soil samples were not acidified to remove carbonate prior to analysis. Rather, soil carbon content was measured in a CHN analyzer before and after loss-on-ignition, and the difference was used to calculate organic carbon content. Although there was high carbonate content in our soils, this method has been widely used in our study region (*sensu* Fourqurean et al 2012), and should provide a suitable relative comparison of soil organic carbon across the bay. We propose to modify the methods text to clarify: “We applied the method described in Fourqurean et al 2012

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for assessing OC content of our carbonate soils. Briefly, total C content of the dry soil and of the residue remaining after ignition at 500 C at four hours was measured using an elemental analyzer; %OC was calculated as %TCdry - (%Cash *(dry wt of soil/dry weight of residue)). This technique has been found to work well in the carbonate soils of Florida Bay (Fourqurean et al 2012b).”

Fourqurean, J. W., G. A. Kendrick, L. S. Collins, R. M. Chambers, and M. A. Vanderklift. 2012. Carbon, nitrogen and phosphorus storage in subtropical seagrass meadows: examples from Florida Bay and Shark Bay. *Mar. Freshwater Res.* 63: 967-983.

General comment 2. To address the comment about root exudates, we propose to add the following statement to page 16293 after line 8: “Further, since a substantial fraction of seagrass primary production is released from roots and rhizomes as DOC (Kaldy et al 2006), the supply of labile DOC to the sediments will be higher in dense seagrass meadows with greater belowground biomass, relative to sparser seagrass beds. This DOC supply could augment the %OC in soils underlying dense seagrass meadows, or could act as a primer for the decomposition of refractory organic compounds.”

Kaldy, J.E., Eldridge, P.M., Cifuentes, L.A., Jones, W.B., 2006. Utilization of DOC from seagrass rhizomes by sediment bacteria: C-13-tracer experiments and modeling. *Mar. Ecol. Prog. Ser.* 317, 41-55.

We agree with the specific comments and will incorporate them in the revision.

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