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Interactive comment on “Organic carbon burial efficiency in a large tropical hydroelectric reservoir” by R. Mendonça et al.

R. Mendonça et al.

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We appreciate the referee's comment and fully agree that reservoirs store considerable amounts of carbon. The main message and core finding of the paper is that reservoirs are sites of efficient carbon burial and we are confident that we discuss the role of reservoirs as carbon sinks. For example, we state that the importance of freshwater systems as organic carbon sinks is known (page 2, line 21) and we suggest that among all types of freshwaters, reservoirs tend to be the sites of more efficient carbon sink (page 17, line 12). In this manuscript, carbon burial efficiency is accessed by relating carbon burial with carbon mineralization in the sediments, i.e. all CO₂ and CH₄ fluxes presented in this paper are fluxes across the sediment-water interface, driven by the degradation of bioavailable OC in the sediment. While we mention reservoir GHG

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emissions in the Introduction (page 3, line 21), we do not discuss the role of reservoirs as source of gases to the atmosphere, in order to keep the paper focused.

We also agree that different OC compounds vary in degradability. We mention, for example, that terrestrial- and aquatic-derived OC may be mineralized/buried at different rates (page 3, line 29) and suggest that a higher share of terrestrial-derived OC leads to more efficient burial because of its low degradability (page 11, line 22). We could emphasize this even more by replacing the sentence “Terrestrially derived sediments have been shown to degrade slowly (Gudasz et al., 2012), especially under low oxygen concentrations (Sobek et al., 2009).” (page 12, line 5) with “Terrestrially derived sediments have been shown to be less labile and degrade more slowly than aquatic-derived sediments (Gudasz et al., 2012), especially under low oxygen concentrations (Sobek et al., 2009).”.

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