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Interactive comment on "Can mud (silt and clay) concentration be used to predict soil organic carbon content within seagrass ecosystems?" *by* O. Serrano et al.

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Review report on the manuscript submitted to BiogeoSciences

Can mud (silt and clay) concentration be used to predict soil organic carbon content within seagrass ecosystems? By Serrano et al.

General comments The manuscript reports on the correlations between organic carbon (Corg), mud content (silt and clay fraction < 63 μm) and delta-13C in sediment cores sampled in a variety of temperate and tropical seagrass habitats. More broadly, the authors investigate if mud content can be used as a good proxy for Corg sediment contents of seagrass ecosystems. The manuscript is totally consistent with the scope

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Discussion paper

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of this journal. The topic seems to me important, in the context of a growing interest in carbon sequestration assessment for marine ecosystems. The techniques used are not new, but this paper is well documented and refers, to my opinion, to relevant bibliography. The manuscript's main point (the mud content is not a universal proxy for blue carbon content but can be used for bare sediments and opportunistic seagrass ecosystems) is well supported by the observations as well as by the statistical treatment. I nevertheless have pointed out a few questions and comments that seem to me worthy to be answered before publication :

Specific comments / technical corrections

1. line 73 & 76 : I would prefer the words "significant relationship" instead "positive relationship". Even if it is true that we logically expect a positive relationship between mud content and Corg, rigorously a strong significant negative relationship could be as useful as a positive one.

2. Line 132-134 : This sentence is not true for P. oceanica. Table 3 shows that for that species, the Corg content decreases when the mud content increases.

3. In Table 2 : Amphibolis grifficiae or Amphibolis griffithii ?

4. Line 148 : the "exponential tendency" for combined Amphibolis spp. is speculative, please rephrase or test non linear relationships.

5. Lines 176 to 182 : This is confusing to me. You say before that ... ... fine-grained sediment can bind larger amount of Corg. But the capacity for silt and clay to bind Corg is limited. ... high mud content in sediments provide reducing conditions that can preserve Corg (lower mineralization rates). then why this could explain relative high Corg contents for some bare sediments with low mud contents ? This mud-Corg saturation needs to be clarified (specially for non-specialists as me).

6. Table 3 : please add in caption what na stands for (not available ?). Would ns – non significant – not be better ?

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7. Figure 1 and 2 : I don't see any difference between the red and the red-intermittent circles in the manuscript version I received. Please, verify.

8. Figure 2, lower-left graph (Mud content vs Corg for estuarine ecosystems). There are 4 points showing high Corg contents (around 6%) for very low mud contents. To which type of ecosystem are they related ? P. autralis ?

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