Biogeosciences Discussions

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Comment on bg-2021-28

Anonymous Referee #1

Referee comment on "Soil greenhouse gas fluxes from tropical coastal wetlands and alternative agricultural land uses" by Naima Iram et al., Biogeosciences Discuss., https://doi.org/10.5194/bg-2021-28-RC2, 2021

The study presents interesting findings of GHG measurement from wetlands and their competing land uses expansion in Australia. I appreciate that the authors have incorporated my previous review comments, specifically by adding their raw data through SI. The current version is well improved. Please find below some specific recommendations which may be useful.

Line 40: this opening sentence sounds awkward and unfinished.
Line 51: need reference.
Lines 53-54: I suggest finding alternative reference since (if I am correct) Boone's papers did not measure CO2 oxidation directly through gas sampling or analyser. They used stock changes instead, which is hard to find out the process underlying lowering soil carbon stocks.
Line 57: how about CH4 emissions from the artificial ditch? I see lots of artificial ditch across agricultural plantation in the tropics.
Line 60: …changing the balance between carbon and nitrogen…. Could you explain a bit more on this process? Any reference?
Line 77: …reinstallation of tidal inundation…, tidal flow restoration?
Lines 79-80: Tidal coastal wetlands?
Line 87: change information to data
Line 97-103: move the current last sentence to the second.
Line 105: in the study site text, I haven't seen any description about the original land cover prior to sugarcane and pasture, were they mangrove, salt marsh or tidal forest? There is still missing information on the reason behind study sites/land cover selection.
Lines 131-137: please describe how did you measure at two different tide conditions (low vs high tide). Did you use a floating collar? Also, currently how spatial replication was performed within the site is unclear. You may want to add this information in table 1.
Figure 1: I would suggest adding sampling location points in figure 1a.
Lines 161-172: did you cut any below ground roots during collar installation? Is one day sufficient to avoid the effect of soil disturbance during collar installation? I have a particular concern about the effect of disturbance from the installation. I understand that fieldwork is always tricky. Otherwise, you could describe this as a study limitation in the discussion or provide relevant reference if required.
Line 168: did you collect 2 samples with 1-hour interval from each chamber? Was it

sufficient to calculate flux?
Line 188: how about the other sampling periods?
Lines 214-215: to me, the bulk density for mangrove and salt marsh are very high, completely different than I observed in low tropics especially for mangrove. This may also reflect in very low C content as provided in Table 2.
Lines 206-219: please provide your stats results in the text, at least p-value, particularly when you compared measured variables between sites and depths.
Figure 2: I would suggest enlarging x-axis labels and chart bars, as well as provide statistical differences note.
Table 3: please provide N sample size.
Lines 274-276: I am surprised that all GHGs are not correlated with temperature. How about root contribution to CO2 effluxes?
Line 285: how did you calculate total cumulative GHG emissions? Did you use GWP? This new paper may be useful and relevant:
https://link.springer.com/article/10.1007/s10021-021-00631-x
Lines 330-336: I would suggest citing the organization name rather than website links