

This manuscript investigated the environmental and biogeochemical factors in controlling CO₂ efflux and organic matter composition along upland to lowland transition in seasonally flooded mineral soils. The experiment in this study is well designed, linked soil CO₂ emissions and related soil and plant properties in field condition. Some of results produced from this study are valuable, to certain extent, and provide additional data to fill the gap if considering the effects of seasonal flooding and mineral composition on C dynamics were rarely investigated in the field. I think the paper is publishable, but it requires minor revisions. Below, please find a list of comments that would be helpful to consider for revision of this paper.

General comments:

1) More recent literatures are needed in the discussion, to make clear what have been done. For example, Page 16 (Lines 15-20), Page 17 (Lines 5-10) the authors cited literatures about contribution of reactive Fe and Al on C accumulation.

2) I would like to see in depth discussion on the physiochemical mechanisms involved in the process of C dynamics with respected to Fe and Al phases in both upland and lowland filed should also be summarized here based on the published literatures. For example, page 16 (line 20-25) presented only reductive dissolution of Fe and Al phases.

3) Further experiment needed on abiotic component (MBC or community structure) and will add values on the obtained data and comprehensive understanding on processes. This would certainly help us better understand the role of wetting and drying cycles on GHG (CO₂, in this work).