

Interactive comment on “Soil greenhouse gases emissions reduce the benefit of mangrove plant to mitigating atmospheric warming effect” by Guangcheng Chen et al.

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Dear Reviewer,

Thank you very much for your comments and suggestions. The followings are our responses to your comments. We hope the following responses and revisions made are satisfactory.

Abstract

Comment 1: Clarifying the extent of the fieldwork outlined in the paper (i.e. number of sites & replicates; and the temporal context). Response: Thanks for the suggestion. More detailed information of the filed sampling strategies was described in the revised

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Abstract section.

Introduction

Comment 1: In the second paragraph, it would be useful to include more recent citations to support the contribution of mangroves to the global terrestrial carbon budget. Response: Some recent studies were added in the revised manuscript to support the contribution of mangroves to the global terrestrial carbon budget. Please refer to Page 1 Line 21-23.

Comment 2: It would also be helpful to provide some justification for the work on Jiulong Estuary, and some assessment of how typical this ‘highly productive mangrove wetland’ might be, so that the transferability of the results presented here can be assessed. At some stage (possibly in the Introduction) a synthesis of recent work by the lead author, and cited here, would be useful – to highlight the novelty of the current study and how (the current study) builds upon previously published work. Response: Thanks for the suggestions. Some justification of the works on mangroves in Jiulong River Estuary was added in the revised Introduction. Please refer to Page 4 Line 11-22.

Methodology

Comment 1: It would be useful to have a justification for the sampling design: i.e. why (and how) were three sample sites identified; and are the authors confident that together these sites are sufficient to represent the mangrove soils of this estuary? The description of each sampling area is also unclear (page 3; line 17). Response: As some mangrove dominated shores in Jiulong River Estuary were subjected to erosion, *Spartina alterniflora* invasion or garbage from upstream, we chose the three mangrove sites in good conditions so as to eliminate such exogenous impacts. The three sites locate at different areas (north-shore mangrove and island mangrove) in the Jiulong River Estuary, and cover both the rehabilitated and natural sites in this region. We therefore considered they are representative. More detailed description of the sites was also added in the revised manuscript; please refer to Page 5 Lines 12-24, and

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Page 13 Lines 2-4.

Comment 2: I am not sure that the second paragraph of Section 2.2 is needed: it would be preferable to have a more concise section on the methods adopted in this study. Response: Agree with the reviewer that the description in this paragraph is not essential. The method for gas flux measurement was revised according to the comments from other reviewers, and this paragraph was removed from the manuscript.

Comment 3: I also wonder why porewater salinity was apparently not measured (given the comment in the third paragraph of the Discussion on page 8). Response: Sorry for the confusion. The present study measured the porewater salinity in the three mangrove sites in summer, along with the gases and soil samplings. As porewater sample was not available for all sample sites due to the high tidal elevation, the present study measured the porewater salinities at the seaward fringe of each mangrove sites. Such measurement does not reveal the salinities within the mangrove wetlands, but could reflect the salinity gradient among the three mangrove sites. The sampling method and results of salinities were provided in the revised manuscript; please refer to Page 7 Line 26 to Page 8 Line 2 and the Result section.

Results

Comment 1: Generally the results are presented in a rather descriptive way; it would be useful to see more detail of the soil physical properties (plotted in Fig 3), and error estimates for the data presented in Table 3. Response: Thanks for the suggestion. The results were rewritten accordingly. The calculation methods of the data in Table 3 were clarified in the Method section, and the available errors as well the calculation methods were also clarified as food note in Table 3.

Please also note the supplement to this comment:

<http://www.biogeosciences-discuss.net/bg-2015-662/bg-2015-662-AC6-supplement.pdf>

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Interactive comment on Biogeosciences Discuss., doi:10.5194/bg-2015-662, 2016.

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