

## ***Interactive comment on “Factors influencing CO<sub>2</sub> and CH<sub>4</sub> emissions from coastal wetlands in the Liaohe Delta, Northeast China” by L. Olsson et al.***

**Anonymous Referee #1**

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The manuscript “Factors influencing CO<sub>2</sub> and CH<sub>4</sub> emissions from coastal wetlands in the Liaohe Delta, Northeast China” assessed the effects of 5 water table, salinity, soil temperature and vegetation on CH<sub>4</sub> emissions and ecosystem respiration (Reco) from five coastal wetlands in the Liaohe Delta, northeast China. This manuscript would be of vital importance to better control GHG balance affected by management actions. However, there exists some questions that the authors should pay careful attentions to revise. 1. In Gas sampling and analysis, as far as I know, plastic chamber is easy to be heated. Does the authors put a white tin foil to wrap the chamber to avoid heating during sampling period? 2. Suggest the authors adjust the order of Result Part. Put 3.3 3.4 before 3.1 3.2. Or merge 3.3 3.4 into 3.1 Environmental parameters 3. If the authors have data on DOC or MBC, suggest the authors add the analysis of the relationship between labile organic carbon and CO<sub>2</sub> or CH<sub>4</sub>. 4. “the soil C:N ratio

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was lower (8.4) than the ratios at the other sites, indicating more labile organic matter at this site and therefore the presence of suitable substrates for methanogens.” How could the author verify this conclusion? Or could you provide some references? 5. “Thus, although salinity levels at Suaeda2 were not always high, any CH<sub>4</sub> that may have been produced in the soil did not reach the atmosphere because of CH<sub>4</sub> oxidation in the upper soil layer. At the rice paddy, the low salinity of around 2 ppt seemingly had no inhibitory effect on the CH<sub>4</sub> production and emission.” For this paragraph, the authors explained the CH<sub>4</sub> tendency in different sites covering salinity, methanogenesis, and aerenchyma in roots. The authors did a thorough analysis by involving these factors, but it seemed authors did not monitor these factors, and emphasized different factor for different sites. Actually, all the factors almost worked together to control CH<sub>4</sub> emissions. Thus, I hope the authors try better to give a more reasonable explanations for CH<sub>4</sub> tendency in different sites. 6. “However, in the present study both soil water table and temperature were important drivers.” There are lots of papers emphasizing both soil water table and temperature to explain the CH<sub>4</sub> emissions. Please list more related references to verify your finding. 7. “At soil temperatures below 18 °C, which occurred before June and after September, CH<sub>4</sub> emission rates were consistently low (< 1 mg CH<sub>4</sub> m<sup>-2</sup> h<sup>-1</sup>).” Could the authors give some explanations for this phenomenon? 8. Reorganize the 4.2 part. Authors emphasize plant biomass and temperature to explain ecosystem respiration, yet this is not agreeable for all the sites, as you discussed. How about the relationship between ecosystem respiration and salinity or soil characteristics? 9. The authors could only estimate GWP by CH<sub>4</sub>, suggest remove the GWP analysis. Or else, the authors give a rough estimate of net CO<sub>2</sub> exchange, and then calculate GWP involving both CH<sub>4</sub> and CO<sub>2</sub>. 10. List ecological meaning for CH<sub>4</sub>/CO<sub>2</sub> emission ratio. 11. “The CH<sub>4</sub> emission rates from the rice paddy in the present study were lower than those reported from continuously and intermittently flooded rice paddies in Nanjing, China, which emitted 1–3 mg m<sup>-2</sup> h<sup>-1</sup> (Zou et al., 2005).” This might be due to temperature differences in the two sites. Please add some related explanations. Also, “The Suaeda wetlands in our study had no net CH<sub>4</sub> emissions over the sampling

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period, in contrast to a Suaeda glauca marsh in southeast China by Xu et al. (2014).”  
12. 4.4 CH<sub>4</sub> emission rates and Reco compared to other studies. What is the new finding in this papers should be emphasized.

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