

## ***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.***

**L. Olsson et al.**

[hans.brix@bios.au.dk](mailto:hans.brix@bios.au.dk)

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As to the specific comments of the referee, we have the following replies. (1) The static gas-exchange chambers were – as stated in the paper – shaded “by using aluminum foil to cover all inside walls to block out light and prevent photosynthesis”. This also minimized the heating of the chambers from solar radiation. (2) The referee suggests the authors adjust the orders of the result by putting Part. 3.3 and 3.4 before 3.1 and 3.2. Or merge 3.3 and 3.4 into 3.1 Environmental parameters. We will change the order of the result section as suggested. (3) Unfortunately, we did not analyze DOC or MBC. Hence, we cannot include such data into the paper. (4) The C:N ratio is commonly used to indicate the lability of organic matter. The higher the ratio, the more recalcitrant the organic matter. We will include a reference in the final paper to justify our

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statement. (5) We agree with the referee that all the mentioned parameters simultaneously affect the rate of methanogenesis and the CH<sub>4</sub> emissions. Unfortunately, we did not measure the rate (or potential rate) of methanogenesis in the soils at the different sites and also not the potential CH<sub>4</sub> oxidation. We will be more careful to explain our findings based on our measurements, and be less speculative in the final manuscript. (6) We will include more references to emphasize the effects of temperature and water table on CH<sub>4</sub> emission. (7) It is difficult to explain the fact that CH<sub>4</sub> emissions were consistently low at temperatures below 18 degrees. However, in the spring the low rates might be associated with a time-lag in the growth of methanogens as the temperature was increasing over a relatively short period. In the autumn the low rates might be influenced by low availability of organic carbon, as most carbon might have been ‘burned off’ during the hot summer months. (8) We think that we discuss the effects of biomass and temperature adequately and provide sufficient references to support our discussion. The relative contribution from soil respiration and biomass differs between the plant communities and also over time. We were not able to identify any relationship between salinity or soil characteristics with ecosystem respiration. (9) We will include a qualified guess on the carbon sequestration in these types of wetlands, justified from literature values. (10) The ecological meaning of the ratio between emitted CH<sub>4</sub> and CO<sub>2</sub> is related to their difference in radiative forcing (a factor of 25). When the ratio is high, the GWP of the emitted carbon is higher than when the ratio is low. (11) Unfortunately, we are not able to explain the differences we have found between the CH<sub>4</sub> emissions from the Sueda wetlands in the Liaohe delta with those reported from other Sueda wetlands in China. We indicate that temperature differences may be a main reason. However, there might also be differences in the soil characteristics. (12) We find it important to put our measurements of CH<sub>4</sub> emission and ecosystem respiration in perspective by comparing the rates with findings of other studies.

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