

## ***Interactive comment on “Greenhouse gas emissions from river riparian wetlands: An example from the Inner Mongolia grassland region in China” by Xinyu Liu et al.***

### **Anonymous Referee #1**

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The paper is well written and has several interesting findings. The main conclusion is that riparian wetlands are potential hotspots of GHG emissions. However, some aspects have to be more elaborated and discussed. Please find the main critical points below.

a) Table 1: please provide the number of the samples (n). Moreover, the grain size distributions (or the %age of sand, silt, clay) should be added. Additionally, the saturated volumetric water content and the residual volumetric water content of the soil should be determined. b) Fig. 3: It is not clear if the SMC(%) is based on volume or mass. Also in the text the numbers for SMC are not clear. I suppose, the values are

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gravitational SMCs. It is important that SMC is related to the soil water capacity and the pF curve of the soils. Therefore, relative saturation would be a better measure. Alternatively, the authors can define the field capacity and the saturation values of the different soils. c) Fig. 4) please integrate into the figures an improved legend. Then you can skip the lengthy text of fig.4. d) Fig. 6) please indicate Riparian wetlands and hillslope grasslands directly in the figures. Then you can shorten the lengthy text of fig. 6. e) line 292 and line 300/ line 301: SMC values of 40 to 60%... This must be related to the soil, because SMC is a function of suction (matrix potential). f) line 312: What means: "SMC was above the saturated water content"? This is not possible. g) Chapter 4.1.3: It would be beneficial for the understanding, if the authors can calculate Co<sub>2</sub> balances. Is the balance of photosynthesis and respiration / emission positive or negative? h) The nitrification / denitrification description is too vague. Please insert the formulas of the nitrification / denitrification processes and determine its relation / quantification. i) table 3: please add the number of samples (n) j) line 464 and line 472: I would like to see the long term balance of Co<sub>2</sub>. Do we have a source or a sink in degraded wetlands considering a longer time span (several years)?

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