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Interactive comment on “Daily CO₂ partial pressure and CO₂ outgassing in the upper Yangtze River basin: a case study of Longchuanjiang, China” by S. Y. Li et al.

Anonymous Referee #2

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This manuscript presents daily CO₂ partial pressure and CO₂ outgassing in the upper Yangtze River basin: a case study of Longchuanjiang, China. In recent years the role of rivers in the global carbon cycle has deservedly received greater interest and CO₂ outgassing from inland waters has become a hot topic. Improving both spatial and temporal budgets for CO₂ outgassing from inland waters is important and where large water-atmosphere fluxes are reported the processes driving this need to be understood (e.g. inputs of organic carbon, CO₂ rich groundwater). Daily time-step measurements as undertaken in this manuscript are an ideal way to improve temporal variability but I have concerns with the sampling protocols and analytical rigor of the analyses. Data for pCO₂ in the manuscript is reported up to 63,000 uatm, which is staggeringly high

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and so needs a clear explanation. Overestimation of pCO₂ is easy to do through contribution of non-carbonate anions to TA for example and the methodology presented here is not transparent enough to determine if these exceptionally high numbers are due to analytical issues. I would need to see a much improved methodology section in any future working of the manuscript and clear explanation for the high pCO₂ measurements and some of the large swings in pH in short-time periods reported. Fundamentally I would like to see more details / data on where the CO₂ fluxes are coming from, as that is what is really useful, i.e. linking to OC compositional data, groundwater inputs, inundated area, to allow future scaling exercises and I have a suspicion that point source pollution could be in play which should be ruled out. To summarize I think the topic is timely but I have significant concerns about data quality and the explanation of the data is unfortunately weak. Both of these points would need clearly addressing in any resubmission. I would also recommend that the manuscript be read / edited by a native English speaker as in a number of places it is not clear what point is trying to be conveyed. This is unfortunate and does not necessarily do the manuscript justice as it adds undue confusion on points the authors may wish to be clear on.

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