Biogeosciences
Discussions

Open Access

EGU

BGD

Interactive
comment

Interactive comment on "Physical-controlled CO_2 effluxes from reservoir surface in the upper Mekong River Basin: a case study in the Gongguoqiao Reservoir" *by* Lin Lin et al.

Anonymous Referee #2

Received and published: 8 September 2018

This study reports CO2 emissions from an hydroelectric reservoir located in the upper Mekong river basin

The writing style makes difficult the review of this article.

The site description is incomplete:

-What was the land cover before flooding?

-What are the water discharge in and out of the reservoir according to seasons? –What is the average water residence time?

-Importantly, the seasons must be described precisely and the same nomenclature

must be used throughout the article instead of using sometimes summer, winter, spring... and at other places warm season, rainy season and even some combination like warm dry seasons... The reader is lost...

-Meteorological information like temperature and rainfall range are required

-the map (figure 1) requires a scale, an orientation and information about direction of the water flow would be welcome.

-is the reservoir thermally stratified? Well mixed? Monomictic?... Such information is required to be able to understand the seasonal dynamic of a lake or a reservoir

The sampling strategy requires clarification

-Can we call the station L as a littoral station since it seems to be an artificial island which has developed after sedimentation in the reservoir? In some part of the manuscript it is also called the drawdown area... Again, the reader is lost by the inconsistence of the vocabulary.

-P3-L19 stations P1 to P4 are considered all together whereas a few lines below, only P2-P4 are considered as pelagic stations. What type of station P1 is representative for?

-Not clear in the sampling strategy and site description but the sampling occurred during the year 2016 (P2L23) while the dam upstream of the study site was completed by December 2016 (Figure 1). Therefore, all the sampling might have been done during the construction which means that the river was heavily disturbed. The construction might have biased the conclusion on the fact that the "pristine river" (as the authors call it) emits more than the reservoir itself.

The methodology is minimalist and substantial information is missing to be able to evaluate the quality of the dataset:

-How many samples were gathered in total? By campaigns? Was the sampling orga-

nized by seasons?

-P3-L25-30: what are the precision, range and accuracy of the gas analyser? What gas flow was used? Did the author used desiccant? Is there a humidity correction is the analyser? What is the volume of the chamber? How were measured the fluxes in the river? At fixed station or drifting with the flow? What was the rejection/acceptance procedure for the measured fluxes?

-What are the precision and accuracy for Temp, O2, pH, conductivity measurements? This is critical for pH since pCO2 was calculated by pH/Alka method. Details on pH measurements are required

- Precision and accuracy and detection limit are required for Alkalinity.

- pCO2 using pH, Alkalinity and the CO2SYS program. This validity of the methodology was discussed recently by Abril et al. (2015) and (Golub et al., 2017) for inland waters

-For chlorophyll: How long after sampling the water was filtered? Were the filters kept in the freezer? What was the precision, accuracy and limit of detection for Chlorophyll, DOC, TOC, TN and TP?

-statistics used for the seasonal and spatial variations were not described

-the thin boundary method which was used according to P6L10 was not described

According to the fact that the sampling strategy and the validity of the pCO2 dataset is doubtful and the quality of dataset cannot be evaluated in absence of information, it is impossible to go further with the review of this manuscript.

Abril G, Bouillon S, Darchambeau F et al. (2015) Technical Note: Large overestimation of pCO2 calculated from pH and alkalinity in acidic, organic-rich freshwaters. Biogeosciences, 12, 67-78.

Golub M, Desai AR, Mckinley GA, Remucal CK, Stanley EH (2017) Large Uncertainty in Estimating pCO2 From Carbonate Equilibria in Lakes. Journal of Geophysical Re-

search: Biogeosciences, 122, 2909-2924.

Interactive comment on Biogeosciences Discuss., https://doi.org/10.5194/bg-2018-244, 2018.