

Interactive comment on “Geochemistry of the dissolved loads of rivers in Southeast Coastal Region, China: Anthropogenic impact on chemical weathering and carbon sequestration” by Wenjing Liu et al.

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Dear Dr. Gwenaël Abril,

Thanks for your interests in our work. Yes, this work is a further study after the previous work in the Qiantang River. However, we think some progresses were achieved in this work compared with the Qiantang river work.

The main goal of the manuscript is to evaluate acid deposition effect on silicate chemical weathering and CO₂ sequestration in one of the three major acid rain areas in

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China (even in east Asia) - Southeast Coastal Region. Dataset in this work incorporates all the major river basins there. This is not a simple attempt to increase sample numbers. As we know, the river basins in southeast coastal China have varied lithology, scale, runoff and anthropogenic background. Investigation in the river systems in the whole area would provide more accurate estimation of acid deposition impact on CO₂ consumption by chemical weathering in southeast China than just simply infer it with only one river basin like the Qiantang River there. In addition, the Qiantang river basin locates at the northwest corner of the target area, and is dominated by carbonate and detrital bedrock, while ingenious is the main rock type in the target area (Fig. 1 in the manuscript). It has been well documented in many weathering researches that lithology serves as an important (first order) control on weathering. So, it is necessary to carry out further investigation on the acid effect on silicate weathering and CO₂ consumption in the whole southeast coastal area after a case study of Qiantang river basin, and the conclusion would be more accurate and direct to meet with the topic of “Human impacts on carbon fluxes in Asian river systems” special issue.

Yes, the previous the Qiantang work should not be missed. We have 121 samples in this manuscript from the whole southeast coastal region, and 18 out of them is from the Qiantang river basin. We have noted them in table 1 and clarified the citation to avoid originality problem. Thanks a lot for your reviewing and kind reminding. Also, we have cited the paper and illustrate the motivation for this work base on our previous studies in the revised manuscript in the supplement (Line 86 to Line 104). About the data plots in the manuscript, figures of ternary diagrams, mixing diagrams with Na-normalized molar ratios, and contribution from the different reservoirs are commonly used procedures to identify the solute origin and their contribution.

Last but not least, after cautiously considering of the constructive comments, the role of another anthropogenic acid (HNO₃) played in the CO₂ consumption or at least the atmospheric HNO₃ input could be constrained in this study. So, we added the discussions of the atmospheric HNO₃ contribution during acid erosion of basin bedrock and

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revised the Fig. 6 in the attached revision in the supplement, to evaluate the anthropogenic impact (sulfuric and nitric acid) on the CO₂ consumption of rock weathering. Hope these efforts will illustrate the relationship between our current and previous work, and make this work be considered as a possible contribution to the special issue.

Thanks for your time and work.

Sincerely yours,

Zhifang Xu on behalf of the Authors

Please also note the supplement to this comment:

<https://www.biogeosciences-discuss.net/bg-2018-109/bg-2018-109-AC4-supplement.pdf>

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2018-109>, 2018.