

## ***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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SC2: Liu et al. report here some interesting data and interpretations on chemical weathering in southern China; using classical geochemical analysis, they were able to quantify the respective contributions of different weathering reactions in the watersheds, including those impacted by humans through acid rain deposition. The paper fits well with the scope of the BG special issue and is based on appropriate methods. However, I found important anomalies concerning the way this paper refers to previous works by the same group on the same topics and in the same region, which makes its

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originality questionable. Indeed, the submitted paper presents many similarities with a paper published in 2016 (Liu et al. (2016) Water geochemistry of the Qiantangjiang River, East China: Chemical weathering and CO<sub>2</sub> consumption in a basin affected by severe acid deposition, Journal of Asian Earth Sciences Volume 127, 246-256), although the 2016 paper IS NOT CITED HERE. From my brief analysis of the two papers, I understood they were based on different datasets in different watersheds (although it is not clear if the dataset published in 2016 is included in the BGD paper or not, and why not). However the construction of the two papers is identical with many similarities in the text. In addition, figs. 2, 3, 4 and 6 in the submitted BGD paper (4 figures on 7 in total) are very similar from those in Liu et al. (2016) although with different data. In order to respect good practice in publishing scientific work, similarities in figures and text should be minimized, and the submitted paper should refer to previous similar works in the same region, citing and incorporating the information already available in the new paper, and extending its conclusion to a broader context. Since the approach and conclusions of the two papers are very similar, it is very odd that the Liu et al. (2016) is not cited and data from the Qiantangjiang River are not incorporated here or at least discussed in comparison with this new dataset.

Author's response:

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 previous work instead of just enlarging sampling area. First, the goal of the manuscript is to evaluate acid deposition effect on silicate chemical weathering and CO<sub>2</sub> sequestration in one of the three major acid rain areas, the Southeast Coastal Region, in China (even in the world). Dataset in this work incorporates all the major river basins with different geology, human disturbing extent and climate background in the area (16 basins and Qiantang River is one of them). It is not a simple attempt to increase sample numbers. As we know and also pointed out by reviewer 2 in the comment, the river basins in southeast coastal China vary significantly

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in tectonic background, 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 chemical weathering and CO<sub>2</sub> consumption 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 igneous rock 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 control on weathering. So, it is necessary to carry out further investigation on the acid effect on silicate weathering and CO<sub>2</sub> 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 Qiantang work should not be missed. We have 121 samples in this manuscript from the whole southeast coastal region, in which 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 97 to Line 108). About the data plots in the manuscript, figures of water chemistry 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 (HNO<sub>3</sub>) played in the CO<sub>2</sub> consumption or at least the atmospheric HNO<sub>3</sub> input has been constrained in this study. So, we added the discussions of the atmospheric HNO<sub>3</sub> contribution during acid erosion of basin bedrock in the attached supplement, to evaluate the anthropogenic impact (sulfuric and nitric acid deposition) on the CO<sub>2</sub> consumption of rock weathering.

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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.

Please also note the supplement to this comment:

<https://www.biogeosciences-discuss.net/bg-2018-109/bg-2018-109-AC10-supplement.pdf>

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

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