

## ***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.***

**Anonymous Referee #3**

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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.,

Many papers on dissolved loads in rivers have been published, but the papers about anthropogenic impacts on chemical weathering and carbon sequestration are rare. Thus this is an interesting paper. Used the water chemistry data measured in many rivers in the Southeast coastal region of China, Liu et al. presented their study on geochemistry of the dissolved loads in the region with severe acid rain impacts. They

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sampled over 100 sites in the high-flow period in 2010, and employed the chemical compositions and carbon isotope ratio to quantify the associated atmospheric CO<sub>2</sub> consumption rates and the contribution of anthropogenic acids. This study found that sulfuric acid played an important role in chemical weathering, and acid deposition should be considered in studies of chemical weathering and associated CO<sub>2</sub> consumption.

In addition, this paper provides a valuable dataset on the water chemistry which can be used for carbon fluxes study. Thus, this paper fits well into the theme of this special volume on carbon fluxes in Asian river. I recommend to accept this manuscript after some minor revision.

Line 215-217, when the authors discuss the source of Cl<sup>-</sup>, they say “In pristine areas, the concentration of Cl<sup>-</sup> in river water is assumed to be entirely derived from the atmosphere, provided that the contribution of evaporates is negligible”. Please give a reference.

In fact it was found that ground water was an important source of Cl<sup>-</sup> for rivers in many regions of China such as the Yarlung Tsangpo basin on the Qinghai-Tibetan Plateau.

L232-L233 High proportion of SO<sub>4</sub> and NO<sub>3</sub> were found in the study area, but the discussion mainly focused on the SO<sub>4</sub>. What was the role of NO<sub>3</sub> in the estimation of CO<sub>2</sub> consumption rate?

Line 321-324 The authors made a comparison between the studied rivers in east coastal region and other major/large rivers in China such as Changjiang, Huanghe and Xijiang river. It will be good to have a forward discussion explaining the major reasons for the difference.

Line 386-387, “Carbonate rocks are generally derived from marine system and, typically, have  $\delta^{13}\text{C}$  value close to zero”, please add a reference

Table 1, how do you measure the HCO<sub>3</sub>? Are they calculated from the alkalinity?

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please provide more info in the method section.

Fig. 5. Please provide the p value.

Other minor comments:

Line 72-74 the sentence is not well structured, please re-phrase.

Line 195 lack space between "%" and "of"

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