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Interactive comment on “Partial pressure of CO₂ and CO₂ emission in a monsoon-driven hydroelectric reservoir (Danjiangkou Reservoir), China” by S. Y. Li and Q. F. Zhang

Anonymous Referee #2

Received and published: 30 September 2013

Review of “Partial pressure of CO₂ and CO₂ emission in a monsoon-driven hydroelectric reservoir (Danjiangkou reservoir), China” by Li and Zhang.

The fluxes of green house gases from the hydroelectric reservoirs had been identified to be strong source for atmosphere. There are limited studies on CO₂ emission from hydropower reservoirs of China, where substantial amount of hydroelectricity is generated. This paper focuses on fluxes of CO₂ from one of the hydroelectric reservoirs, Danjiangkou Reservoir in the Han River, to examine the spatial and temporal variability, controlling factor and flux to atmosphere. This paper brings important information on flux of CO₂ from the hydroelectric reservoir of China and it is relevant to the journal's interest. However, the authors did not successfully explored the data to explain

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controlling processes.

1. Page 17-18: Line: 359: monsoonal precipitation in the upstream of reservoir have large effects on aquatic pCO₂ levels. ...". And further indicated that (line 367) that "initial rainfall enhances the export of soil CO₂ and soil organic carbon load to river system. ." what about the pH of the rainfall which is expected to be different from initial rainfall to latter. Depending on the aerosol loading and their characteristics, the pH of initial rainfall depends. In the tropical regions, the initial rainfall is acidic and the following would be close to neutral or little basic. Therefore information on rainfall pH would greatly help in interpreting the data. 2. Page 21: Section 4.2. The authors correlated pCO₂ with several chemical, biogenic elements, and water pollution parameters. Except with few (such as Chl-a, DO and nitrogen) they did not find significant correlation and attributed that multi-collinear effects of water quality properties. However, the influencing factors on pCO₂ may be significantly different during dry and wet period as discharge from upstream, soil CO₂, weathering products and atmospheric sources (rainfall) etc would influence during latter and they have relative low role to play during former period. Therefore, dividing the entire data into two categories (wet and dry) may lead to better correlation with other properties measured which may result in better explanation on pCO₂ variations. Since this is the one of the major objectives of this study, this must be explored.

Interactive comment on Biogeosciences Discuss., 10, 10055, 2013.

BGD

10, C5518–C5519, 2013

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