

Interactive comment on “Technical note: Applying equilibration systems to continuous measurements of $p\text{CO}_2$ in inland waters” by T. K. Yoon et al.

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Please refer to the attached supplement file for our detailed responses to the comments offered by reviewer 1.

Response overview: We appreciate your constructive comments and suggestions. We will revise our manuscript incorporating all your comments and suggestions. The revised manuscript will be checked again by a native English editor to improve accuracy and readability. Some of your and another reviewer's major comments are overlapped, so the same overview of our common responses is provided as below.

(1) Review: There was a common critique on the novelty of our literature review; the

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review was evaluated as “somewhat limited” or “not a novelty”. We agree to your comment that equilibrator systems have been reviewed and assessed in other studies, but we would like to ask your attention to the fact that our review is the first effort that compares application potentials of the three gas equilibration systems for both underway and temporally continuous pCO₂ measurements. To our knowledge, there have been rare efforts to review the three systems from theory to applications focused on freshwater systems. For examples, excellent assessments by Santos et al., (2012) and Webb et al., (2016) focused on the response time of various equilibration systems using laboratory experiments but lacked details on theoretical/technical backgrounds, power requirements, maintenance, and so on. We expect that this introductory review would help researchers initiating pCO₂ monitoring study obtain both theoretical and practical information. However, if the editor and reviewers want us to remove or reduce the review section, we will follow the suggestion; we could incorporate the essential contents into the introduction section or keep only focal review components (e.g., applications of gas equilibration systems to continuous measurements) in a separate, but reduced review section.

(2) Additional monitoring data: In response to the comments on the lack of measurements by the marble-type equilibrator in comparing the performance of the three equilibration systems, we will include additional field measurements that would be useful when comparing the performance (e.g., response time) of the three systems.

(3) Methodological details: More detailed descriptions on our gas equilibration systems, together with other in-situ measurements such as pH, and analytical procedures and QC procedures, will be added in the Methods section, Table 1, and Figure 1.

(4) Target water systems: We used inland waters in the title because we also considered estuarine waters in literature review and our field study. For example, our study site includes a tidal reach of the Han River estuary (e.g., sites 10–12 in Figure 3 where underway investigation and long-term monitoring were conducted). We would like to keep this term, but will switch to “freshwater” if the editor and reviewers want us to

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focus on freshwater systems.

Please also note the supplement to this comment:

<http://www.biogeosciences-discuss.net/bg-2016-54/bg-2016-54-AC1-supplement.pdf>

Interactive comment on Biogeosciences Discuss., doi:10.5194/bg-2016-54, 2016.

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