

Interactive comment on “A high-frequency atmospheric and seawater $p\text{CO}_2$ data set from 14 open ocean sites using a moored autonomous system” by A. J. Sutton et al.

Anonymous Referee #2

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Sutton et al. present a new set of high resolution mooring data of the sea surface and atmospheric $p\text{CO}_2$ for the period 2004–2011 derived from a Moored Autonomous $p\text{CO}_2$ system. The authors have done a great job to describe (a) the measurement system, (b) the processing of the data and (c) their uncertainty estimation. The data are easy to access and I am convinced that they will be widely used within the community and this manuscript will receive many citations. I would like to recommend the manuscript for publication after a few minor comments (below) have been addressed by the authors.

Specific Comments:

Page 388, lines 12-13: “... scientific community identified that constraining ocean
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biogeochemical models would require much greater temporal and spatial resolution of field data.” - please add a reference to this statement.

Page 388, lines 21-22: “This level of accuracy has allowed the scientific community to constrain regional sea-air CO_2 fluxes to 0.2 Pg C yr⁻¹” - please add a reference to this statement

Page 388, lines 25-26: “... it has not solved the problem of quantifying temporal variability at a given location” - this statement is not quite correct. E.g. Watson et al. 2009 use underway data to investigate the variability at a given location, i.e. the subtropical North Atlantic. I suggest to change “at a given location” to “at a given point in space”, to make the statement more clear.

Page 390, lines 19-22: “The LI-820 is calibrated before every measurement using a “zero CO_2 reference” derived by scrubbing CO_2 from air using soda lime and an ESRL standard gas that spans the ocean $p\text{CO}_2$ values where the system is deployed” - This information is repeated on page 391 lines 3-5 (where it fits better) and can be removed on page 390.

Page 392, lines 19-20: A question out of interest: Why has the system been set so it would take a measurement every 3h and not e.g. more frequent?

Page 393, lines 7-8: “... they have been deployed since 2011 and are not included in the finalized data set presented here” - Will they be included in the future, and – again out of interest – do you plan to update this data set on an annual, biannual, etc basis?

Page 411, table 4: How do you account for the uncertainty attached to measurement of the underway systems, the $p\text{CO}_2$ calculation from DIC and alkalinity or the globalview data?

Reference:

Watson, A. J., et al. (2009), Tracking the variable North Atlantic sink for atmospheric CO_2 ., *Science* (New York, N.Y.), 326, 1391, doi: 10.1126/science.1177394

