

Interactive comment on “Detecting anthropogenic carbon dioxide uptake and ocean acidification in the North Atlantic Ocean” by N. R. Bates et al.

Anonymous Referee #2

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General comments

The BATS time series observations are one of the foundations for evaluating the response of the oceans to increasing atmospheric carbon dioxide. Time series observations in key ocean environments are yardsticks for model developments. This manuscript describes the carefully executed and quality controlled work at BATS from the beginning in 1983 to 2011. Intermittent evaluations of the time series are to be welcomed and the publication of this one is recommended after minor revisions.

The BATS time series is leagues apart from the GEOSECS data when one considers confidence in the numbers. This reviewer has serious reservations about presenting them together as is done in Fig. 8. Does it throw light on ocean processes or improve our understanding, by observing (page 1003), that the GEOSECS (adjusted for bias

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and seasonality??) data fall not far away from the back extrapolation of the regression line? The later TTO data is of better quality, but still with adjustments (?). My doubts about Figure 8 are in fact also the argument for the necessity of sustained observation work that the BATS series represents.

In section 4.2 the authors observe that the CO₂ sink in the N-Atlantic subtropical gyre has not changed significantly over the last 30 years. They challenge the results from shorter term observations (<10 yr) which suggest differently (e.g. Schuster and Watson, 2007; Schuster et al., 2009, Watson et al., 2009). This brings up the question: What did BATS show for the short periods examined in these other works?

Specific comments

P990 Line 4 Where does the 30% figure come from? I could not find it in the main text.

P996 Line 3 This section on a comparison of measured and calculated pCO₂ seems irrelevant in the context of the time series.

P1002 Line 18 The reference Olafsson et al. 2010 is not listed.

P1015 Line 2 Add Revelle factor

P1015 Line3 Replace E with F

Interactive comment on Biogeosciences Discuss., 9, 989, 2012.