

Interactive comment on “Atlantic and Arctic sea-air CO₂ fluxes, 1990–2009” by U. Schuster et al.

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We thank both anonymous reviewers for their constructive reviews. Below are detailed responses.

Anonymous Referee #1

1. Focus on the term “best estimate”

We use ‘ “best” estimate ’ in the paragraph from line 13 to 24 on page 10688, on line 24 on page 10693, and in the revised Conclusions for consistency with other RECCAP papers in the BG/BGD archive (e.g. Khatiwala et al.) but otherwise remove the term

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nology and use the term “our estimate”. In section 2.4 Statistics, we add a paragraph explaining what we mean by “best” estimate and how it is derived.

Anonymous Referee #2

2.1) Labelling of regions

It is true that e.g. our North Subpolar region is not identical to the northern subpolar gyre, due to the straight longitudinal and latitudinal boundaries. However, to make the manuscript easier to read, we have kept the regions’ labelling.

2.2) Inclusion of $\Delta p\text{CO}_2$ results

The authors agree that comparisons of $\Delta p\text{CO}_2$ would be interesting, and much of our own work focuses on $p\text{CO}_2$ studies. However, we do not add this to the manuscript for two reasons. (1) Several of the methodologies to which we compare (atmosphere inversion, ocean inversion) do not produce results in terms of $p\text{CO}_2$; and several of the ocean models have not provided $p\text{CO}_2$ output. Thus, $p\text{CO}_2$ comparisons would only include a subset of results and thus would not be consistent with the overall manuscript that seeks focuses on the common quantity, CO_2 flux. (2) Additional comparison would necessarily lengthen the manuscript that is already quite long. We hope that future manuscripts by ourselves and/or others will follow on our findings with respect to CO_2 flux with this kind of investigation.

2.3) Length of conclusions

We have revised the conclusions to be less abrupt and to add the requested points.

2.4) Page 10669 Line 1:

Title changed as suggested.

2.5) Page 10681 Line 9:

URL added to the caption of the last table for the NAO.

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2.6) Page 10696 Line 4 and 6:

“pCO₂ database” is correct; the correlations are shown in Figure 7 (now ref inserted in the text), which does not include the climatology; strongest correlation is between the pCO₂ database and the other methodologies.

2.7) Page 10718 Table 8:

Numbers have been checked and no decimal place is missing.

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