

Interactive comment on “Spatiotemporal variations of $f\text{CO}_2$ in the North Sea” by A. M. Omar et al.

Anonymous Referee #1

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The reviewed manuscript is aptly titled in that it considers the “spatiotemporal variations of $f\text{CO}_2$ in the North Sea”. The work was done by a group of scientists with considerable experience in these measurements and in that particular ocean system, so the work is very clean and well done. The organization of the text was so precise that I can only describe it as ‘mechanical’; there were no surprises in organization.

The data are beautiful, demonstrating how to make good use of VOS data. The analyses performed should serve as a model for subsequent VOS/ $f\text{CO}_2$ reports that will come from other groups. The allocation of forcings of seasurface $f\text{CO}_2$ variability between SST, bio/mixing, air/sea exchange and SSS was very nicely done. Again, a model for others.

Disclaimer: I do not work with air/sea exchange of CO_2 or any other gas, so someone
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with that expertise needs to review the paper closely for those more technical aspects.

Overall the paper is well written, but there are some edits I recommend:

Page/line:

2/2-3: This is an abstract, so the exhaustive detail should be eliminated. Delete “..(MS Trans Carrier and MV Nuka Arctica), acquired along one zonal and one meridional transect (2005 – 2007). . .”

2/9: If the above sentence fragment is deleted, then change to “Along a meridional. . .”

2/12: If the above sentence fragment is deleted, then change to “Along a zonal. . .”

2/13: change to “annual mean $f\text{CO}_2$ ”

2/13-15: Not sure what to make of starting the sentence with “annually” and ending it with “throughout the year”. They seem to be incompatible.

2/24: delete “The” before “comparison”

3/27: “line was initiated in 2005 and funded by. . .”

4/2: “which covers”

6/28: “except that SST and MSLP were used instead of p_{eq} and T_{eq} , respectively”

7/1: “assess” is misspelled throughout the text

Figure 2: I suggest that Figs 2a and 2b become Figures 2 and 3. They do not look like parts of a single figure.

9/12: should be “because”; also, “4.23%” seems overly precise for this work

11/30: “dependent”

14/1: “In order to comprehend the importance. . .” Is that what you meant? “apprehend” doesn’t make sense.

14/11: “is not unlikely” is a double negative. Should be “is likely”

15/6: “As to a third possible cause..”

Throughout: the word “which” is commonly and correctly preceded by a comma, which sets off the separate point being made. This rule does not apply to “at which” or “for which”.

Figure 1 caption: “data. . .were acquired”, not “data . . .are” (check for this error throughout text; it wasn’t done correctly anywhere; e.g. Table 2/line 4). Also, “. . .2005-2007, and names (as initials) and their. . .” Or, this part about names and designations could be moved to the end of the caption, where the names are given.

Interactive comment on Ocean Sci. Discuss., 6, 1655, 2009.