

Earth Syst. Sci. Data Discuss., author comment AC5
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Reply on CC1

walker smith

Author comment on "Primary productivity measurements in the Ross Sea, Antarctica: a regional synthesis" by Walker O. Smith Jr., Earth Syst. Sci. Data Discuss.,
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Responses to Heather Bouman

Thank you for your comments, especially since the paper was modeled after Bouman et al. (2018) in ESSD! Most are easy to respond to, and below is the listing of changes I have made.

- 18: "/" changed to "-"
- General comment re italics: In the version I am looking at *Phaeocystis* and *antarctica* are all italicized. I can only imagine that during pdf formation those were removed, but prior to submission of the revision, I will check those carefully. Similarly, all exponents were checked and all were correct in the version I have.
- "Biogeochemical models" was added (now L. 77).
- Information is now provided on the types of bottles used as well as the blue filters used (L. 90-91).
- HPLC pigment data are not available for all cruises, but the various data sets referenced present HPLC data when available. A statement has been included (L. 152-154) that states that while phaeopigments are present, they are in very low concentrations (suggesting that microzooplankton grazing is minimal, although this is not mentioned in the manuscript), and that fluorometric and HPLC chlorophyll a values are highly correlated with a slope near 1.
- Heather is correct in that chlorophyll c₃ is not simply confined to diatoms. However, in the Ross Sea its presence is largely confined to diatoms that occur there (coccolithophorids do not occur in the Ross Sea), making it a reliable pigment to separate functional groups, especially when used with other HPLC pigments. The statement has been modified (L. 149) to reflect this more accurately.
- The statement about the comparison of assimilation numbers and has been hopefully clarified (L. 161-163).
- A revised statement concerning the blue filters (L. 90-91) now indicates that the same filters were used for all productivity determinations as used in controlled P-E incubations.
- Sadly, this was not a typesetting issue, but a terrible error on my part. It has now been corrected.
- The standard deviations were not plotted initially because they were large, and the plot became a bit unmanageable and the vertical trends obscured. Heather's comment is correct; the standard deviations were listed in Table 3. In this revision the standard errors in Figure 2 are removed and only the means plotted, retaining the clarity for the

vertical information. The standard deviations are retained in Table 3 but are also mentioned in the figure caption for Figure 2 as well. An additional comment is included in the text (L. 188-189) that emphasizes the large variability in the chlorophyll-normalized rates of carbon fixation.