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Ocean Science
Discussions

Interactive comment on "Phytoplankton distribution and nitrogen dynamics in the Southwest Indian subtropical gyre and Southern Ocean Waters" *by* S. J. Thomalla et al.

Anonymous Referee #2

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Review of m:" Phytoplankton distribution and nitrogen dynamics in the Southwest Indian Subtropical gyre and Southern Ocean Waters", by S.J. Thomalla et al. (os-2010-3). General comments: the topic of the ms is potentially an interesting one: phytoplankton distribution and physiology in otherwise largely ignored oceanographic regions. Unfortunately, the way the ms is organized now, it is almost inaccessible for the reader. The ms is very "wordy" with often repetitions, it is unclear what the specific scientific goals were, what methods were used, where samples were collected, and how the results should be interpreted. The authors seem to follow many sidelines, creating confusion for the reader. Finally, it seems that simply all the data is shown (16 figures, with 61 (!!) graphs), apparently without any attempt by the authors to "digest" the data.

Publication is only warranted in case all these issues are addressed. The ms should be made shorter, focused on the research questions and the data, with a proper interpretation of the main results.

It would take too much time to comment all points that could be improved. Limiting myself to the major issues:

Introduction: should be limited to being relevant for the research question(s), for example eliminating the paragraph on effects of iron. No measurements on iron were done in this study, and the role of iron could briefly be mentioned in the discussion.

Sampling and analytical methods: nutrient measurements play a critical role in the ms. Yet, details on accuracy and precision, use of certified reference materials is lacking. I have great doubts on measuring ammonium concentrations in preserved samples (in other words: I believe this is impossible). How could 10% of the ambient N be added as 15N when the concentrations of total N were measured in the home laboratory ?

Results: even the most interested reader is lost in the 61 graphs, the lengthy text, the confusing indications of the sampling depths, etc., etc. As often, the authors measure Chl a and subsequently this is interpreted as biomass. How do the authors distinguish between different taxonomical groups of the phytoplankton? As far as I can judge, size fractionated samples for Chl a analyses were taken. This allows for distinction between large and small phytoplankton, but how were diatoms recognized ?? The data should be reduced. What were the main findings ? For example focus on the two distinct oceanographic regions as end members. Sections discussing the results should be removed here and transferred to the discussion section.

Discussion. Two different oceanographic regions (subtropical versus subantarctic with temperature and nutrient concentrations different) can be discerned, with the phytoplankton distribution rather uniform, nitrogen uptake low everywhere (regenerated production dominant), but the authors speculate and hypothesize for page after page, until the reader gets the impression that huge differences are present. Chl a is what it is: Chl

a and NOT a reliable indicator of phytoplankton biomass, see for example (Behrenfeld et al. 2005; Kruskopf and Flynn 2006). Not a single Fe measurement was made by the authors, still one paragraph is used to discuss the role of Fe discussion. Similarly, Si uptake not measured during the expedition, but Si limitation discussed. The authors should focus on the experimental results, and leave out all speculations.

Interactive comment on Ocean Sci. Discuss., 7, 1347, 2010.