

# ***Interactive comment on “Environmental controls on the elemental composition of a Southern Hemisphere strain of the coccolithophore *Emiliana huxleyi*” by Yuanyuan Feng et al.***

## **Anonymous Referee #2**

Received and published: 13 September 2017

This manuscript presents data examining how environmental conditions control the elemental composition (C, N, P) in a Southern Ocean isolate of the coccolithophore *Emiliana huxleyi*. The authors thoroughly test a wide assortment of environmental parameters using laboratory batch culturing experiments. This manuscript provides additional data that expands upon a recently published paper by the authors (Feng et al., 2017). Overall the manuscript is easy to follow, though there are a number of typos and inconsistencies that need to be addressed in the text and tables. The gradients across which the authors assess elemental composition are extensive, though regrettably there is no exploration of synergistic relationships between the variables (which the authors acknowledge). The authors state in the text that they were able to rank the

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importance of the different environmental variables, but the table containing that information (Table 3) was not included in the manuscript pdf, making it difficult to comment on that topic.

Specific comments:

Not sure if this is a journal formatting issue but there should be either spaces or indentation to separate paragraphs. This is consistent throughout the manuscript.

Inconsistent use of serial commas

The authors are inconsistent in using the modifier “cellular” when referring to the various forms of particulate organic matter. If, as I suspect, they are only referring to cellular forms of such matter, then the continual use of the “cellular” term is unnecessary.

Pg7 line7: Delete ‘then’.

Figures 1-5: If you are fitting curves through data points, would it not be better to plot all of your data points using a scatterplot as opposed to using bar plots? This would give the reader a much better sense of the variability within the data.

Section 3.1: You don’t mention anything about the effects of nutrients on POC.

Why are the values for goodness of fit in the supplement and not in the manuscript?

Pg9, line 15: The ‘dramatic’ decline was predominately seen between 4 and 7°C and leveled out thereafter. Maybe change the wording to more correctly state this response.

Table2: The meaning of bold values should be stated in the table caption, not in the manuscript text.

Table2: There are numerous values that are stated as being significantly different in the text but are not bold in the table.

Table2: Why are these data presented as a table instead of plots as were used for the

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previous metrics?

Section 3.8: I could not find the Table 3 that is referenced in the text, making it difficult to review this section.

Pg13, line26: typo

Pg13, line27: typo

Pg14, line2: typo

Pg14, line5: Why are cell size data not presented (in text or supplement) in either this manuscript or Feng et al., 2017?

Pg14, line8: Don't you mean greater than 11°C, since 10°C was not tested in this study and PIC values did not appear to differ amongst the 4, 7, and 11°C treatments?

Pg14, line10: Again referring to data (cell volume) that is not presented.

Pg14, line11: 10°C was not a treatment level in this study.

Pg14, line15: The best-fit line does not follow this description. Given the poor fit based on the low R2 value, why is this fitting included?

Pg14, line16: 24°C was not a temperature used in this study or Feng et al. (2017)

Pg14, line23: A 74% increase is not really 'almost double'.

Pg16, line2: This study did not use any isotopic labeling. I assume that this is referring to Feng et al. (2017).

Pg17, line23: You could also cite Blanco-Ameijeiras et al. (2016) in PLoS ONE since they tested 13 strains under the same environmental conditions, avoiding inter-laboratory experimental variability that is an issue when comparing results from different experiments.

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Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2017-332>, 2017.