

This work adds incremental knowledge about the environmental forcing of coccolithophores and diatoms distribution in the southern ocean. In the future, the importance of this work may be that it serves as a base line study. The paper is well written and substantial with many references, although I believe it could be shortened by about 25% and still say the same. Based on the abstract and conclusions there is not much new insight except that the authors are looking at diatoms and coccolithophores at the same time. There is a host of environmental data and they are discussed at length but few significant patterns emerge which is often the case in beyond control “ships of opportunity studies” where the research is constrained by circumstances, timing, and sampling strategy. This brings up the next point:

The collections design was perhaps not ideal. In the paper (page 4 line 25) it says that water was collected from the upper 30 m. Apparently, only one liter of water was sampled that integrates the entire 30 m? This is really precious little water unless I am reading this incorrectly in which case it needs to be explained. It is well known that phytoplankton biomass can occur below this level (e.g. Hegseth and Sundfjord, 2008). Why was the collection limited to 30m? Also the method of identification is not really suited to a detailed morphological analysis of *E.hux* which is important especially in the southern oceans where there exist various morpho/phenotypes of this species. What were the reasons for the magnifications differing at 5kx and 3kx? What about all the other material on the filter? There are many generalities in the paper that could use more explanation. Some of these are defined by G below;

G: Page 2 line 5: Takahashi wrote many papers on CO₂ sequestration of CO₂. How do we know whether the CO₂ that is being taken up by areas of the ocean is anthropogenic or natural? Also the North Pacific is also such an area.

G: >Page 2 line 7-9: vague sentences. Poorly constrained, critical? Why

G: >Page 2 line 28-30: Why important

Page 3 line 1....”south of ~30°S and extends to ~60°” (This has already been stated.

G: Page 3 line 25 “uncertainties” why?

Page 5 line 11: Why were individual coccoliths not counted? This can also say a lot about the age of the community.

Page 7 line 5-13. Can all these parameters be displayed graphically?

Page 7 line 29. Maybe I missed it but what were ALL of the 28 coccolithophore species?

Page 11 line 28 “occurrences” instead of “features”

Page 12 line 7. Where is the rest of the Chl coming from? This section is (lines 7-9) is not clear

Page 13 line 4 “coccolithophores IN this region”

Page 14 line 10 What is the “theoretical species abundance”?

Page 15 line13. "However A FEW non-blooming

Page 15 line 14 "conspicuously absent" why is this conspicuous?

Page 15 line 14-15 "to be a *E. huxleyi* specific rather than a coccolithophore-wide phenomena"
not clear what the authors meant to say. I don't agree.

Page 16 lines 25-27...There are many studies con and pro for this sentence