

Interactive comment on “Phytoplankton community disruption caused by latest Cretaceous global warming” by Johan Vellekoop et al.

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The paper by Vellekoop et al. discusses the impact of the ocean warming (related with the LMWE) on the marine phytoplankton and the benthic ecosystem. This interesting paper is very well written with excellent illustrations and definitely fit with the scope of the journal. However, I have a couple of comments which needs to be addressed before the paper gets accepted.

Does the paper address relevant scientific questions within the scope of BG? Yes

Does the paper present novel concepts, ideas, tools, or data? Yes

C1

Are substantial conclusions reached? Yes

Are the scientific methods and assumptions valid and clearly outlined? Yes

Are the results sufficient to support the interpretations and conclusions? Generally, yes, but the difference between the dinocyst assemblages and the benthic foraminiferal assemblages in the post-warming interval is not convincing. On what data is this statement based on? How many data points are we discussing here? Outside of abstract and conclusion, it is only stated briefly on p.7 line 13-15 without any references to a figure.

Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? Yes

Do the authors give proper credit to related work and clearly indicate their own new/original contribution? Yes

Does the title clearly reflect the contents of the paper? Yes

Does the abstract provide a concise and complete summary? Yes

Is the overall presentation well structured and clear? Very well

Is the language fluent and precise? Yes, but please have a look at my comments below. Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? An inconsistency: P.1 line 11 (kiloyear) vs. p.2 line 10 (kyrs). It can be changed to 350 000 years in both places. K-Pg in the abstract is not defined (p.1, line 23). Please be consistent and use Fig. in the main text *in some places it is spelled in full.

Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? No, the quality and the number of figures is excellent.

Are the number and quality of references appropriate? Yes

C2

Is the amount and quality of supplementary material appropriate? I suggest to title the file "Supplementary Information" and label tables and figures Sx (e.g. Fig. S4) and not (SI Fig S4). Following this, in the main text it is enough to refer Fig Sx.

I have few other comments which needs to be addressed:

p.2, line 5: double species

p.2 line 7: should be 66.4 – 66.1 Ma

Is it Material & Methods or Material and Methods?

Material & Methods: in this chapter it should be mentioned in which profile the benthic foraminifera were analysed. So far this information is included only in the introduction.

p.3, line 27: I suggest to include the info on the FAD of these taxa. Secondly, an expression "low numbers" should be somehow defined (i.e. below x% of the total relative/absolute dinocyst assemblage)

p.4, line 10: "previously published" can be changed to "existing" Results: the results of the foraminifera analysis should be briefly mentioned here.

p. 4, line 32 – p.5 line 1: this sentence should be rephrased

p.5, line 2: this is the first time the foraminifera record is mentioned here and it is not really clear what is this interpretation based on. Please consider to rephrase this part.

p.5, line 15-16: The sentence is not really clear. Consider rephrasing to: "In addition, if the high SSTs in late Cretaceous were somehow limiting the productivity, increased temperatures may have further boosted growth rates" (if I understand the meaning correct).

p.5, line 33 to p.6, line 2: "bloom/blooming" is mentioned really many times here and it disturbs the flow. Please consider to rephrase this part to avoid numerous repetitions. The same for p.7 lines 23-24.

C3

p.6, line 6-11: This statement needs to be justified better, by perhaps supporting this statement with a reference to a proper figure

p.7 line 1-2; I suggest to add an age reference here "Likewise, during the Middle Eocene Climatic Optimum, a warming interval which took place XX Ma, dinoflagellate blooms...". It is clear that this is an event from the Eocene, but not all know the age of the event.

p.7 line 3: remove T

p.7, line 13: "the former Maastrichtian dinocyst assemblages returned" rephrase

Please check "SI Tables". The text does not look right in the uploaded file. I suggest to upload all range charts as Excel files (or on <https://www.pangaea.de/>?) instead. It will read so much easier than in the current version.

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2019-231>, 2019.

C4