

Interactive comment on “Potential Impact of Carbonate Chemistry Change ($p\text{CO}_2$) on Krill and Krill-based Food chain in the Southern Ocean with emphasis on Embryogenesis of Antarctic krill” by Robert Y. George

Anonymous Referee #1

Received and published: 7 August 2017

This manuscript is a review (no new data presented) with a primary emphasis on the effect of PCO_2 on krill in the southern ocean. While the paper expresses some viable concerns, there is just not sufficient data at present to warrant the speculation. There have been only 3 papers published on the effects of ocean acidification on Antarctic krill and the targets range from embryogenesis to adult grazing rates and excretion. The results are highly variable, in some cases preliminary, and not particularly alarming. Only at 2000 ppm PCO_2 is embryogenesis affected. Temperature is much more of a concern yet that is hardly touched in this manuscript.

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The hypothesis about interacting effects of temperature, hydrostatic pressure and PCO₂ on embryogenesis is interesting and worthy of future study. I might support a manuscript focused on this aspect alone without all of the overly-broad review and speculation. A clearly stated hypothesis, some calculations and schematic diagrams are needed.

Krill are not heavily calcified and there is little reason to expect calcification to be an issue for them. The data on crustaceans more broadly is limited and contradictory.

There is no reason to expect hypoxia to be a problem for Antarctic krill yet this manuscript discusses it.

The discussion of pH variability in Antarctica and with depth is important but confusing and poorly written. Krill are exposed to wide variations in PCO₂ in swarms, during phytoplankton bloom variation, seasonally etc.

I've never seen PCO₂ expressed in microatms. μatm .

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2017-207>, 2017.

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