

Topical Editor Decision: Reconsider after major revisions (26 Jan 2021) by [Andrew Yool](#)

Comments to the Author:

Dear Authors,

Thank you for your responses to your referees and for your revised manuscript draft.

I have now reviewed these materials, and while I judge that your answers address the majority of the points raised, I believe the discussion around the performance of the model's silicon cycle could be more thorough. This aspect of the model is the focus of this study after all and, as the referees remark, the model has some clear deficiencies.

One way to address this could be to contextualise the model's performance against comparable global-scale models, such as those produced as part of the CMIP process. Many of these models now include a silicon cycle, and the CMIP repository include a number of relevant diagnostics, including silicic acid and diatom biomass / production distributions. Models are, inevitably, always deficient, but a straightforward way to illustrate the utility of one is to show how it improves our ability to represent a real world system relative to the current state-of-the-art (or, at least, compares with this).

I would appreciate it if you could expand on this portion of your response to your referees. As both of the referees judged your manuscript to require major revisions, I will be returning it to them subsequently, but I believe more completely addressing this issue of performance (i.e. relative to other silicon cycle models) would strengthen the manuscript draft ahead of this.

Please get in contact with me should you have any questions or require any assistance about any of the above.

Thank you again for your response and revisions.

With best regards,

Andrew Yool.

Non-public comments to the Author:

Dear Authors,

Further to my comments, I would just add that I have some direct experience with CMIP models, so can provide some guidance if necessary.

Andrew Yool.

The authors thank Professor Yool for considering our manuscript. We have now included comparison to CMIP6 data. In addition, we have included comparison to a newly-published silicon cycle review that suggests our model is actually performing better than previously thought.

Best regards,

Karin