

Interactive comment on “Exploring coral reef responses to millennial scale climatic forcings: insights from a 1-D numerical tool pyReef-Core v1.0” by Tristan Salles et al.

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General comments:

We would like to thank the reviewer for raising these 2 comments one on carbonate framework production vs biological performance or growth and the other about disturbance.

We acknowledge and value the review comments about the general “lack of congruence” between a reef’s biological performance and geological performance, but agree with the review that it is out of scope of the current MS. However in future iterations

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of the model, we plan to implement a modified version of the coral production framework so as to better investigate the case where vertical accretion rate do not reflect the growth rate of corals.

In regards to the second comment, we agree that accounting for the frequency of disturbances and length of periods of stress, is critical if one wants to investigate present and near future reef evolution processes. Adding this in our modelling framework might be possible by incorporating some sort of recruitments function as suggested by the referee.

Minor comments:

Comment: Bottom line, page 4 – “acidity” is used to name an environmental factor in oceans. Although the ocean pH may have gotten as low as 7.4 – 7.6 during the Cretaceous and early Paleogene, I don’t think the oceans have ever been actually acidic. The term “acidification” is being used to refer to a lowering of pH towards acidity, but it will never actually reach acidity.

Response: Following reviewer’s comment, we have modified the text to prevent any confusion and we are now referring to pH instead of acidity throughout the manuscript.

Comment: Second line, page 6 – Change “have a negatively effect” to “have a negative effect”.

Response: we have changed the corresponding line as suggested by the reviewer.

Comment: Figure 2 caption – “GLVE equations” is redundant because the E in the initialization is for “equations”

Response: We have delete “equations” to avoid redundancy.

Comment: First line of text below Table 2 on page 15 – change “data implies” to “data imply” or “data suggest”.

Response: We have changed the text to “data suggest” as proposed by the reviewer.

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Comment: Top line, page 22 – change “data is scarce” to “data are scarce”.

Response: We have changed the text to "data are scarce".

Comment: Figures 6 and 7 – I have a hard time distinguishing the shades of blue representing different depths. I suspect many readers will have the same problem. Please make the colors more distinct or use different colors for the different depths.

Response: Following reviewer’s comment, we have modified the colours to make them easier to read. To keep consistent over the manuscript we have modified the colours in figures 2, 5, 6, 7 and 8.

Please also note the supplement to this comment:

<https://www.geosci-model-dev-discuss.net/gmd-2018-29/gmd-2018-29-AC1-supplement.pdf>

Interactive comment on Geosci. Model Dev. Discuss., <https://doi.org/10.5194/gmd-2018-29, 2018>.

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