

## ***Interactive comment on “Modeling coral calcification accounting for the impacts of coral bleaching and ocean acidification” by C. Evenhuis et al.***

### **Anonymous Referee #2**

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Evenhuis et al. present a novel model of coral calcification taking into account bleaching and ocean acidification. The model accounts for healthy, pale, bleached and recovering coral states and is thoroughly confronted with data at multiple scales. The model is very simple and elegant in some aspects, detailed in others, while ignoring some other, perhaps essential factors. It reasonably reproduces literature observations and thus the conceptual model underlying the mathematical models makes sense. The topic is highly interesting for Biogeosciences audience and a revised version would therefore make a valuable contribution, but the present version needs significant modification.

One, the presentation of the model is not easy to follow. The notation might need  
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attention for a biogeosciences audience. I also advice to clearly define units at an early stage. For instance, the population of healthy corals ( $P_{subH}$ ) is presented in equation 1, but the units are not presented. At this stage it could be biomass, density, ... There is quite some repetition of very similar equations (4, 5, 6) and (3, 7,10), this confuses the non-specialist reader.

Two, there are a number of miss references to figures and equations which confuse the reader. For instance, p. 200, line 27-28: Eq. 4.1 and 4.2 (these do not appear in the text) and the link with Figure 3 is unclear. Similarly, p. 202, line 1-3. Another example (there are more): p. 203: should Fig. 6 not be Fig. 5?; p. 211: should Fig. 11 not be Fig. 9.

Three, abbreviation are used without proper definition before: GBR (Great Barrier Reef) on p. 203; DHW (degree heating week?) on p. 190.

This paper needs to be carefully checked, rewritten for clarity and another round of evaluation before eventual publication. Strengths and weaknesses of your modeling approach could perhaps be stronger articulated.

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