

Interactive comment on “Polar coralline algal CaCO₃-production rates correspond to intensity and duration of the solar radiation” by S. Teichert and A. Freiwald

Anonymous Referee #2

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The manuscript describes an original investigation on the carbonate production of polar corallines, based on a previously unexplored method of growth zones coloration and calculation of incremental weight of produced algal carbonate. The paper is clearly written and the interesting data on these extraordinary rhodolith beds deserve publication after moderate revision. I've remarked some points of weakness that can be summarized here:

1) The age model for the algal growth is based on the idea that each zone corresponds to one year as the conceptacle production. However a large degree of uncertainty exists about the matter, and the manuscript fails to clarify the matter. In particular, the interpretation of Fig. 3 is weakly supported by the evidence (low resolution picture, C7199

and possible misinterpretation of the microscopic anatomy of the algal zonation?) and literature data are inconclusive (see annotated manuscript). I suggest to clarify in the manuscript what is really known and accepted and what still remains in the field of hypotheses.

2) The multiple regression gives a very high r value due to the redundancy of variables. Some of them should be eliminated from the discussion, since one mirrors the other (for example the duration of the polar night and the latitude)

3) The inverse correlation of carbonate production and water saturation is unexpected but apparently significative. It deserves discussion, or removal for further exploration.

4) References could be improved (see annotated manuscript), in particular the data contained in table 1 has been dealt with in a recent review (Geodiversitas special volume) and the table could be easily substituted by reference to that paper.

Please also note the supplement to this comment:

<http://www.biogeosciences-discuss.net/10/C7199/2013/bgd-10-C7199-2013-supplement.pdf>

Interactive comment on Biogeosciences Discuss., 10, 14115, 2013.