

Interactive comment on “Effects of light and temperature on Mg uptake, growth, and calcification in the proxy climate archive *Clathromorphum compactum*” by Siobhan Williams et al.

Anonymous Referee #1

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This is an interesting study on the influencing variables within the calcification process of *Clathromorphum compactum*, a coralline red alga that is well known for its usability as a temperature proxy from various studies. Because of its longevity, it appears as a very suitable organism for the reconstruction of the past climate, even extending historical times. Moreover, the organism was also successfully used for the reconstruction of sea ice cover.

Against this background, it is very important that the function as a proxy of *C. compactum* is really reliable. In this regard, the study is a very good approach in evaluating

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the different effects of light and temperature and also the combination of these variables. The methods are scientifically sound and I like the circumstance that the experiment was carried out over a comparatively long time interval and under quite realistic conditions, including the presence of the grazing chitons.

I consider the methods and results substantial and also the discussion of the future implications for the use of *C. compactum* as a temperature proxy is reflected and constructive. However, I miss the discussion of the results in view of the former studies which use *C. compactum* as a temperature and sea ice proxy, especially the (cited) studies by Halfar et al and Hetzinger et al. Are the results of these studies still sound? I think this should be discussed in greater detail.

Additionally to this, I made some specific comments throughout the manuscript, which is attached to this review. Especially, I would be interested in more information of the production of starch also in the wound tissue, just as I mention it within my remarks.

Altogether, I consider this study a valuable contribution to our understanding of *C. compactum* as a climate archive and recommend it for publication in *Biogeosciences* after a minor revision.

Please also note the supplement to this comment:

<https://www.biogeosciences-discuss.net/bg-2018-128/bg-2018-128-RC1-supplement.pdf>

Interactive comment on *Biogeosciences Discuss.*, <https://doi.org/10.5194/bg-2018-128>, 2018.

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