

Biogeosciences Discuss., author comment AC1
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Reply on RC1

Philipp M. Spreter et al.

Author comment on "Calcification response of reef corals to seasonal upwelling in the northern Arabian Sea (Masirah Island, Oman)" by Philipp M. Spreter et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2021-213-AC1>, 2021

Dear Reviewer 1,

on behalf of my co-authors, I would like to thank you very much for commenting on our manuscript. Your comments are important for us to improve the significance of our work.

In order to prevent misunderstandings during the further review process, we would like to comment here on the aspect of a supposedly insufficient number of replication analyses.

We are aware that the community standard for annually resolved coral calcification studies requires a higher number of replicates than just three specimens.

In contrast to conventional calcification studies, however, the focus of our study is to describe skeletal calcification performance at a sub-annual scale. We achieve this by establishing complex age models based on geochemical analyses (Li/Mg, Ba/Ca). These analyses are time-consuming and above all cost-intensive and are therefore not applicable to large sample quantities.

To reduce possible misinterpretation of our data due to intra-reef variability in coral calcification, we originally investigated a total of six coral specimens (26 years of calcification) from Masirah Island with regard to mean annual extension rate and skeletal bulk density. The results of this preliminary study demonstrate the bulk density of the corals to be consistently lower and the extension rate to be higher than that of the reference corals growing at equal temperatures (Fig.1 attached to this message). Although six annually resolved samples per site is perhaps the lower limit for coral calcification studies (see Lough and Barnes, 2000, JEMBE), the consistency of our data strongly supports an environmental signal related to upwelling, rather than intra-reef variability.

Due to the manuscript's focus on sub-annual resolved calcification records, we selected three out of the six samples for further geochemical analysis (laser ICP-MS) that were considered representative for the site studied. The results from these samples are presented in our manuscript. We fully understand to have puzzled the attentive reader by the small number of replicates. The complete annually resolved data of the six corals from Masirah Island will be provided in a revised version of the manuscript as a supplement with an appropriate reference in the main text.

A detailed response to all reviewer comments will follow in the further review process.

Please also note the supplement to this comment:

<https://bg.copernicus.org/preprints/bg-2021-213/bg-2021-213-AC1-supplement.pdf>