

Interactive comment on “Ocean acidification accelerates dissolution of experimental coral reef communities” by S. Comeau et al.

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Dear Steve and co-authors,

Your article is very interesting and I hope that it will be published soon in Biogeosciences.

I have a few questions and comments though. 1/ M&M and Discussion: Could you please precise if rubble and dead reef/corals were present in flumes in addition to sediments and live coral colonies? Rubble and dead reef areas are indeed an important component in reefs (see comment below).

2/ Conclusion: Bioerosion process does not result solely from the mechanical activity of organisms. It does include biogenic dissolution by microborers (e.g. review by Tribollet

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2008) and sponges for instance (Zundelevich et al. 2007; Wisshak et al. 2012, 2013). Please be more precise in the discussion when reporting "dissolution vs bioerosion processes". What do you mean by "dissolution"? When measuring net dissolution rates at the scale of a reef community, chemical dissolution (derived from the bacterial activity and chemical conditions) and biogenic dissolution are quantified simultaneously.

Note that biogenic dissolution by microborers concerns all carbonate substrates including sediments, shells, live and dead corals, live and dead CCA, etc... This process cannot be ignored and is especially efficient in hard reef substrates (compare to sand). Similarly the whole process of bioerosion (i.e. mechanical abrasion by grazers, dissolution and abrasion by worms, bivalves, sponges and dissolution by microborers) is more intense in hard dead substrates than in live substrates and sand. The main agents of biogenic dissolution in reefs are microborers and OA should increase rates of biogenic dissolution by 50% or more by 2100 (Tribollet et al. 2009). Recent studies confirmed this positive effect and others showed a similar effects on boring sponges (Wisshak et al. 2012, 2013). Thus, part of the process of CaCO₃ dissolution is missing if no rubble/dead reef pieces were added in flumes.

I suggest to precise in the discussion that (a) part of the process of [biogenic] dissolution was overlooked as dead reef/rubble were not studied (if considered, they would amplify net dissolution rates measured during the day and especially at night) and (b) the ratio between living coral cover, sand AND dead reef areas will influence greatly the carbonate budget under OA conditions.

Hoping that these comments will help. Best, Aline

Interactive comment on Biogeosciences Discuss., 11, 12323, 2014.

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