

Interactive comment on “Benthic buffers and boosters of ocean acidification on coral reefs” by K. R. N. Anthony et al.

Anonymous Referee #1

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General Comments This contribution represents a very well conceived and impressive experiment on a highly pertinent question to the coral reef-climate change/ocean acidification research community: how do common benthic communities on coral reefs affect seawater carbonate chemistry and how (or will) this change with ocean acidification? These data are incredibly important and should be published.

I do have one comment that I recommend the authors consider as I believe it will strengthen their paper considerably. Since Kinsey's (1985) seminal work, the paradigm of coral reef metabolism is that the photosynthesis to respiration ratio (P/R) of coral reefs is approximately equal to one. In other words, these communities generally consume the same amount of carbon they fix, either via respiration or consumption by heterotrophs (which is then respired as CO₂). Even recent field work using high-

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resolution and sophisticated methods have shown this to hold true. For example, Falter et al. (2011) showed that an algal-dominated reef flat had a P/R ratio of 1. This was maintained during a storm – light and P declined. Respiration also declined in concert with the decline in light and P.

I think this a very important point that the authors need to consider and discuss. There seems to be a discrepancy between the field data and what the authors observe experimentally. Why? When you add everything together on a reef, does it all just balance out?

Technical corrections 1) Page 1846, Line 18. Should be extent, not extend. 2) P 1849, Line 15. There is an "a" that should not italicized

References cited Falter JL, Atkinson MJ, Schar DW, Lowe RJ, Monismith SG (2011) Short-term coherency between gross primary production and community respiration in an algal-dominated reef flat. *Coral Reefs* 30: 53–58.

Kinsey DW (1985) Metabolism, calcification, and carbon production: I. Systems level studies. *5th Int Coral Reef Congr* 4:505–526

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