

Interactive comment on “Reviews and Syntheses: Ocean acidification and its potential impacts on marine ecosystems” by K. M. G. Mostofa et al.

Anonymous Referee #1

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Ocean acidification, the other CO₂ problem, could significantly influence marine ecosystems. One well-known effect is the lowering of the calcium carbonate saturation state, and ocean acidification alters phytoplankton abundance and carbon fixation rates in some photosynthetic organisms. Mostofa et al discussed mechanistic insights into the aforementioned processes and pH changes, and focused especially on processes taking place with different time scales and potential detrimental effects to marine organisms, and of ecosystem processes and services. Indeed the topic is attractive, timely, and can raise important issues. The work described in the manuscript appears to be competently performed and the results are interesting and useful. The manuscript is reasonably well written and easy to follow; however, there are a number of aspects,

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which, to my opinion, need improvement prior to a publication in Biogeosciences.

General comments:

1. The major impacts of ocean acidification are decreased pH and increased inorganic carbon availability. Many of the referenced studies only analyzed the impacts of reduced pH - this should be considered.
2. I am concerned about the confusing use of direct and indirect evidence to support relationships proposed in the review. Specifically, I think that section “Stress caused by algal or red-tide toxins and pathogens” lacks direct evidence.

Specific comments, following the order of the manuscript, are listed below.

1. P10942 line 1, CO₂ seeps, for example, from sub-seabed storage and volcanic vents in shallow submarine should be considered.
2. P10946 line 3, “atmospheric CO₂ and Sand Jensen, 1997”, something missed or add a “(” between “and” and “Sand”.
3. P10946 line 27, Is “increase” correct? suggest changing “increase” to “decrease”.
4. P10961 line 10, “Elevated P CO₂ causes bacterial community shifts” is incorrect. The influence of higher CO₂ and lower pH on ocean microbial community has not been completely verified in terms of significance. For example, some studies observed their is little effect of pCO₂ treatments (380, 540, 750, 1,120, and 3,000 μ atm) on microbial diversity (Joint et al., 2011; Tait et al., 2013).

Lidbury I, Johnson V, Hall-Spencer J, Munn C, Cunliffe M (2012). Community-level response of coastal microbial biofilms to ocean acidification in a natural carbon dioxide vent ecosystem. *Marine Pollution Bulletin* 64: 1063-1066.

Taylor JD, Ellis R, Milazzo M, Hall-Spencer JM, Cunliffe M (2014). Intertidal epilithic bacteria diversity changes along a naturally occurring carbon dioxide and pH gradient. *FEMS Microbiology Ecology* 89: 670-678.

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5. References need to follow journal requirement.

6. Figures 2 and 4, Fig. a, b and c should have uniform size.

Interactive comment on Biogeosciences Discuss., 12, 10939, 2015.

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