

## ***Interactive comment on “Impact of carbonate saturation on large Caribbean benthic foraminifera assemblages” by Ana Martinez et al.***

**Anonymous Referee #3**

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Review of “Impact of carbonate saturation on large Caribbean benthic foraminifera assemblages” by Martinez et al. for Biogeosciences

In order to assess the impact of carbonate saturation on the assemblages of large benthic foraminifera in the Caribbean, Martinez et al. compare assemblages at low pH, low calcite saturation submarine spring sites with control sites of higher calcite saturation. This is an important question to tackle given that carbonate saturation will likely decrease in the future due to the increased impacts of ocean acidification. This is a unique experimental setup to take advantage of a natural location where these impacts can be studied. The authors find that at the low pH sites, there is a decrease in total benthic abundance, and increase in symbiont bearing species, and an increase in agglutinated species. Overall, non-symbiont bearing species may be more sensitive

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to the impacts of ocean acidification. The paper is well written and organized well, and I have only a couple of comments that I believe the authors can easily address. I should note that I am not a specialist in large benthic foraminifera, so I hope that the other reviewers may have more specific points about that.

Key points: (1) One of my main concerns with the study is that the authors are quick to dismiss that there may be other environmental differences between the submarine springs and the control sites, and perhaps too simplistically conclude that the carbonate saturation (and pH) differences are the main control on the foraminifera assemblage differences. For example, there are large salinity differences between the sites that I think warrants more discussion. Are there any differences in food sources, turbidity, depths, etc? (2) The authors choose to analyze the >250 micrometer fraction of sediment, but do not explain their choice for this. I think that by choosing this fraction, they may be omitting smaller, important foraminifera from their analyses. One of the potential impacts of decreased carbonate saturation is that foraminifera may be smaller. So, it may be that by looking at this larger size fraction, they are missing foraminifera that may be smaller at the submarine spring sites but may still be present. It would be very helpful if the authors can repeat some analyses using a >150 micrometer fraction, for example.

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