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

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Dear Inge,

Thank you for your thoughtful comments on the paper. Ana is defending her thesis this month but we will be revising the manuscript to address your comments right after the defense. Specifically, we will look again at the smaller size fraction to see if that changes the conclusions. we selected to focus on the large size fractions because there seems to be more material and it was easier to identify the forams.

To answer a few quick questions you had -

Page 3 line 14: What kind of substrate was present and was there a difference in substrate near the vents and at the control site? - substrate is coarse sand at both

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locations which are only a few meters apart.

Did you include plants (some benthic species prefer to live on plant debris)?. No we did not include any epiphytes unless they were in the sediment. Because there are no grass beds right at the spring we set the control at a similar site as this made sense for more direct comparison.

Did you apply rose bengal staining to only analyze living specimens? we used rose bengal but pretty much everything got stained so that did not work well. We also tried cell tracker green but in this case only very few forams got stained so that was not useful for the statistics.

Page 3, line 15: Why did you choose 250 um? Normally 125-150 um is used (Schonfield et al., 2012: Marine Micropaleontology, 94–95), since you might miss the trends in the smaller community now. The trends you observed might be true for larger specimens, but perhaps the smaller specimens tell a different story:

Note that the title is reflective of the fact that we looked at the large fraction but we will check the rest for comparison.

Page 4, line 13-14 I am not sure about 'lumping' low mg forams together with porcelaneous in one group, since it is known from countless studies they respond different to increased pCO2, perhaps due to e.g. solubility of high MgCO3. Did you check if both hyaline and porcelaneous species in this group show similar trends? Otherwise you might be skewing your results, especially since you see no significant change in weight of shells of Discorbis. I would also be very interested to see (relative) abundances of low (e.g. Discorbis), intermediate (Amphistegina, Astergerina) and high Mg species (Quinqueloculina, Archaias) between ojos and control. It would bring something new to the existing studies on different sites, especially since you have the opportunity to test it here on species with very contrasting Mg content.

We have the information by species and will check to see abundance vs Mg/Ca content.

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Discussion section: The authors do not (clearly) explain why the abundancy of agglutinating foraminifera decreases at the vents. They do not calcify or have symbionts, so the explanations given to explain the calcareous response (proton pumping and symbiont activity) do not apply. Could salinity play a role?

The salinity difference is small but and this does not seem to be the case in the correlations trends maybe it is related to higher energy environment close to the ojos..... However as you said the abundance of agglutinating foraminifera is very low already in the control sites so most likely the numbers are not high enough to make big statements of agglutinating foraminifera being more resilient to low calcite saturation state. and we will qualify this statement.

Page 7 line 22-29 The authors missed a big overview study by Doo et al., 2014 (Biol.Bull. 226: 169–186.) in which they present a nice overview of response of larger benthic foraminifera to ocean acidification. I think their discussion would benefit from including these observations. For instance, to look at the different kind of symbionts (diatom, dinos) your foraminifera species have and if they follow the general trend of Doo et al., 2014. It would also be informative to add an overview of the response of benthic foraminifera (symbiont/non symbiont) in different studies, like in Keul et al., 2013 to show how your data fits laboratory and field experiments.

Thanks good suggestions to look into

Minor comments will be corrected

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