

## ***Interactive comment on “Cold-water coral growth under extreme environmental conditions, the Cape Lookout area, NW Atlantic” by F. Mienis et al.***

### **Anonymous Referee #2**

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#### General comments:

This manuscript describes the habitat and oceanographic characteristics around the cold-water coral mounds of the Cape Lookout area off of the Southeast U.S. coast. The authors do an excellent job of presenting the conditions surrounding these coral mounds and discussing this with respect to the coral distribution and community structure. I feel that the oceanographic data is of broad interest and is particularly significant in that it demonstrates the persistence of deep-water corals in a dynamic environment that may be right at the edge of their tolerance.

While this section of the paper is the most well designed and presented portion of the study, the integration with the community ecology and habitat modeling components could be improved. In particular, the oceanographic data presented in this study do

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not appear to be used in the niche modeling analysis to help improve the predictability of coral distribution. In addition, the models are presented at a spatial scale that is far greater than the data presented in the manuscript, and because of the difference in scale, I don't find the models very informative. They simply confirm that there should be deep water corals in a very large region, where they are already known to occur. If these models would use more of the new data presented here and used to refine our understanding of the controls on coral distribution, they would be much more informative and would be a better fit in the manuscript.

The community ecology section of the manuscript generally feels like an add-on that is not well integrated with the rest of the study. The data are presented as differences between substrate types, but this is not tested with any rigorous statistics. It is also not correlated to the oceanographic data in any way, and since that is the real driver of the paper, it made me wonder why these data were included. There was a chance here to integrate the oceanography data, especially the acoustic backscatter, with an analysis of the community structure of pelagic species that may be interacting with the coral habitat, but I never saw this happen.

#### Specific comments:

P5 L1-2: There are many more studies of the . . . "living fauna and ecosystem functioning of smaller coral habitats. . ." that the authors neglect, including any mention of the Gulf of Mexico work of some of the co-authors. This seemed strange to me. . .

P8 Section 2.2: The methods of the predictive modeling need clarification. There is no mention of the sources of the data used in this study. Were some of these collected as part of this study? If not, where did they come from? Are they actual data, or the results of modeling studies? This is especially significant for the aragonite saturation state data.

P18 L6: This is one of the most glaring examples of a lack of statistical rigor. Statements like "In general, faunal abundance increased whenever coral framework was

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present. . ." is not backed up by any sort of test. Please avoid making conclusions without statistical tests.

Fig 6: These pictures don't seem to support the habitat classification. Were the proportions of substrate types simply determined by approximation, or were the photos digitized and proportions calculated using software somehow? There seems to be a lot more living coral in 3 than in 4. Also, it is unclear what the word "slope" is referring to here. The continental slope? The depth range doesn't seem to be sufficient for that to be true – there are no "lower slope" surveys.

Fig. 7: Was it really not possible to ID the fish beyond bony fish vs. cartilaginous fish? I'm not sure whether these very large groupings are relevant in any community function analysis.

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Interactive comment on Biogeosciences Discuss., 10, 18925, 2013.