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Interactive comment on “Upwellings mitigated Plio–Pleistocene heat stress for reef corals on the Florida platform (USA)” by T. C. Brachert et al.

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GENERAL COMMENTS

This paper reports the calcification records of fossil Pliocene – Pleistocene z -corals from the Florida carbonate platform, analyses the relationship between calcification rate, density banding and d^{18}O and d^{13}C records in the same corals, and finally discuss the potential causes producing the different patterns observed and their implication for interpreting the environmental / climatic changes in the region. This is a substantial and significant contribution in terms of both methodological approach and interpretation of results for the scientists dealing past environmental and climatic changes or more specifically on proxies in coral skeletons. The methodological ap-

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proach is clearly explained and appropriate to reach the objectives of the paper. Data and their interpretation are well presented and justified, making both interpretation of results and conclusions highly convincing.

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SPECIFIC COMMENTS

16555 lines 10-11: The last sentence of the abstract requires more detailed explanation to be fully understood by the reader.

16555 lines 23-24: The term “simplified” is not appropriate because the same skeletal structures also exists in *Porites* but these are porous or more discontinuous, which gives this spongy aspect to the overall skeleton. Just re-phrase as following: “In *Porites*, the spongy aspect of the skeletal architecture results from laterally fused . . .”

16556 lines 22-25: reference(s) needed at the end of this sentence.

16558 lines 16-17: I understand that study of the stratigraphic units from which the coral specimens have been sampled, are described elsewhere but I do think that a short summarise of the stratigraphic and paleoenvironmental context would be useful for a better understanding of the discussion section.

16559 lines 5-8: “*Orbicella*” is used by Budd et al. (2012) only for the Atlantic “species complex” *Montastraea annularis*, but not for the other Atlantic species “*Montastraea cavernosa*” for which the original genus name *Montastraea* is used by these authors. Another genus name has also been used for the Indo-Pacific *Montastraea* in the same paper. So, this is not a “simple” substitution of generic name for another. So, you can use the name “*Orbicella*” following Budd et al (2012) if your coral specimens belong to the *Montastraea annularis* group.

16559 lines 13-16: please give the limit of detection of the diffractometer in the Methods section (instead of page 16562).

16562 lines 13-14: It is not clear if the patches of isopachous or radial aragonite is a diagenetic cement or not. Please rephrase.

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16564 lines 6: This should refer to Fig. 5 or not?

16565 lines 8-9: Delete the brackets in the last sentence of this section, since this point is particularly important.

16566 lines 22-24: Bulk density is expected to vary between taxa because it depends also from the coral microstructure. I wonder what's happen when comparison is made within taxa?

16572 - 16573: Relationship between timing of the density bands and annual extension rate together with timing of the high density band in the year for modern corals have been subject to many discussions and debates since the 80's. The discussion in this paper may provide new keys for interpreting patterns of density bands in modern corals. I think it would be important to highlight this aspect somewhere in the paper (end of abstract, introduction, conclusions).

16577 lines 17-19: This last point of the discussion should be discussed / developed a bit further.

Interactive comment on Biogeosciences Discuss., 12, 16553, 2015.

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