

AUTHOR RESPONSE TO REVIEWER 1

(Author responses are located below each reviewer comment)

Reviewer General comments:

This is a very good paper based on a rare data set that is well processed, providing both original results and a very informative discussion. Processing is simple in its principles, but rigorous. This simplicity makes the paper easy to follow, even with a rich set of results.

The study has different scales of analysis and at the habitat-scale, it brings very interesting details. Also, some of the results could not really be foreseen (fig 5) and this brings a lot to the hurricane and coral reef literature, even if it specific to a Florida reef.

The reader will have access to detailed results that are not necessary to review here, but the study certainly provides a unique database in the context of Caribbean-Atlantic reefs, and as it claims, it fills some major gaps.

Really I don't see much to complain about with this paper, except two minor comments. It could be publish as is, which is something I have seen only twice in my reviewing career.

Author Response:

Very many thanks for your helpful review, perspectives, and comments. We've provided responses to your specific comments below and have revised the manuscript as indicated.

Reviewer Comment:

L122: I would not say Florida Keys, or the FRT in particular, is a barrier reef ; No way. Rather call them shelf reefs.

Author Response:

We appreciate the reviewer's comment and have changed this text to indicate 'shelf reef' instead of a 'barrier reef' to be consistent with literature on the geologic structure of the reef system (line 130 in revised manuscript). We have also included a reference to Lidz et al. (2003) for a more detailed discussion of the Florida Keys Reef Tract. The Florida Reef Tract is often referred to as a 'barrier reef' or 'barrier bank reef' by its management agencies but we agree that 'shelf reef' is a more appropriate term for this study (for example, the NOAA Florida Keys National Marine Sanctuary

<https://floridakeys.noaa.gov/corals/coralreef.html#:~:text=The%20Florida%20Keys%20are%20h,ome,is%20about%20four%20miles%20wide>, and Florida Department of Environmental Protection, [Florida's Coral Reefs | Florida Department of Environmental Protection](#)).

Lidz, B.H., Reich, C.D., and Shinn, E.A. 2003. Quaternary submarine geology in the Florida Keys. GSA Bulletin 115:845-866. [https://doi.org/10.1130/0016-7606\(2003\)115<0845:RQSGIT>2.0.CO;2](https://doi.org/10.1130/0016-7606(2003)115<0845:RQSGIT>2.0.CO;2)

Reviewer Comment:

L541 (and elsewhere): Accretion: I would not use this word here, as I would consider it as the process of incorporating the sediments and other calcareous material in the reef structures itself, hence a hardening process different than sediment deposition and movements.

Author Response:

We understand the reviewer's perspective, particularly with respect to hardening of materials deposited on and within reef structure that contributes to vertical accretion. However, we respectfully disagree that hardening, or lithification, is a requirement for defining accretion on coral reefs. For example, coral reef cores can often show accretion of unlithified sediments over short-term (seasons to years) to long-term (100s+ years) periods of time. Our elevation change analyses in this study represent change over short-term time periods (seasons to years) and our discussion includes comparisons to previous elevation change analyses over years to decades. These elevation change measurements reflect the net outcome of all processes that increase or decrease elevation (either gradually or due to storm events), including sediment deposition or erosion due to physical transport within the system, sediment creation (for example, due to coral breakdown/degradation, etc.) or carbonate dissolution within the system, export or influx, compaction, etc. We feel that the term 'deposition' doesn't accurately capture what is measured by our elevation change measurements; thus, we chose to use the word accretion. We have added a sentence to section 2.3, first paragraph (lines 201-203 in revised manuscript) to clarify that we are using elevation change to estimate the net effect of all processes affecting accretion and erosion in the system; and our use of these terms throughout this study indicates estimates of net accretion and net erosion from our measurements.

Reviewer Comment:

Then, may be no need to talk about restoration (L32, abstract). This is the trendy word of the moment in coral reef literature and beyond. Everyone is using it, which bothers me, and it is not justified here. Or add a specific technical paragraph in the Discussion in how there results could really help restoration (only one hint on restoration taking into account the results is provided in the conclusion).

Author Response:

We appreciate the reviewer's perspective and agree that a detailed technical discussion of application of our results to restoration is beyond the scope of our paper. We have removed the following text from the abstract (line 32) since it is not a primary focus of the manuscript: "and help guide benthic habitat post-storm recovery and restoration efforts in topographically complex coral reef systems". Our results do, however, provide valuable information on the physical state

of the seafloor environment with respect to rates of change in accretion and erosion that affect long and short-term seafloor stability. We feel this information could be applied to guide and improve placement of transplanted species on the seafloor to improve long-term restoration success (e.g., identification of locations that show long and short-term seafloor stability for placement of slow growing corals, or locations where placement of seagrass would be beneficial to reduce sediment erosion). Thus, we have chosen to keep the brief statement in the last paragraph of the conclusions that describes the potential utility of our results for this purpose.

Reviewer Comment:

Technical corrections: none, did not see any errors.

Author Response:

We appreciate your review.

END OF REVIEW AND RESPONSE