

Interactive comment on “Divergence of seafloor elevation and sea level rise in coral reef regions” by Kimberly K. Yates et al.

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The aim of this contribution is to evaluate the effects of disturbances (resulting in erosion) that have affected coral reef systems over the last several decades and to project future evolution. Five reef systems selected from the Atlantic and the Pacific have served as test sites. The methods used herein to assess vertical reef growth and volume loss are highly sophisticated and a number of methodological subtleties are not realized by the reef geologist who I am. As a consequence, I really do not know what to think about the accuracy and value of the data. A colleague aware of this kind of innovative approach would be in a better position than me to discuss the value of the findings. However, I am a bit dubious about the accuracy of the results (reef elevation and volume gains versus losses) based on the comparison between historical (?) and modern soundings records, despite the multitude of triturations and corrections made

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to the raw data.

Therefore, my comments will be limited to some issues of detail.

Page 1, Line 1 : All dictionaries define *sea floor* as *the bottom of a sea or ocean*. Accordingly, using this term to describe the Pre-Holocene bed rock that underlies a coral reef body and forms its foundation is inappropriate.

Page 3, Line 17 : I question the use of *the number of people living close to the reef sites* as a parameter for anthropogenic impacts. Is the number of inhabitants the reflection of the local human activity (fishing, ...) ?

Page 12, Line 16, about *the coral-dominated habitats* : It would be useful to have some information about the living coral cover. This will inform the debate on the real state of health of each studied reef site.

Page 14, Line 8 : about the chronic erosion processes. These are natural processes affecting reef systems. Reef growth reveals to be the subtle balance between constructional and destructional processes. They occur continuously on both pristine and degraded systems.

Page 14, Lines 20 – 21 : It is clear that reefs that are located closed to urban areas are suffering significant deterioration. It would be interesting to compare these results with a reef system located in a remote and not inhabited area.

Page 14, Lines 26-27-28 : about the assertion *coral reefs in all three regions will be unable to keep up* (Church et al., 2013). This is an overinterpretation of the data presented herein. Using mean rates of reef accretion established at the scale of the Atlantic and Pacific to infer future responses of reefs to the rise in sea level is not receivable. A number of previous studies worldwide indicated that vertical reef accretion varies from site to site in a given region. There, some reefs will be able to maintain pace with sea level, while others will be unable to compensate for sea level rise.

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Page 15, Line 29 and Page 20, Line 23 : Please correct the reference : Neumann and Macintyre, 1985

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