

# ***Interactive comment on “Technical Note: Low Cost Mesocosms Design for Studies of Tropical Marine Environments” by Ruben R. Raygosa-Barahona et al.***

## **Anonymous Referee #2**

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The article by Raygosa-Barahona et al. presents some useful information about the technicalities of mesocosm studies in tropical environments. As such, it is indeed well suited for a technical note. However, in its current form, the manuscript feels rushed and unpolished, containing many mistakes, inconsistencies and omissions, thus requiring refinements. If the authors were to correct the irregularities and add information on the water immersion of their mesocosms (pictures, schematics or figures), it would greatly improve the manuscript. In the context of a technical note, the introduction on the biological ramifications of temperature control may be expendable to allow the authors to focus on the technical aspects.

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Specific comments: P1. Line 7: Mesocosms are often deployed in situ, thus are not necessarily an alternative to in situ studies.

P2.L4: Is there really no tropical mesocosm experiment performed after 2013? Many subtropical experiments have been conducted under conditions that could warrant a comparison, and/or an inclusion.

P2.26 All organisms except phytoplankton? Under which circumstances? What do you mean by “high rate of nutrient and carbon cycle”. To what processes are you referring? Please refine and rephrase.

P5.8 Please provide a range of GoM temperature variations.

P5.9 What do you mean by “this is the mean characteristic for using an auxiliary heating or cooling system”? Also, please fix the references.

P5.18 Confusing sentence.

P5.21 Confusing sentence.

P5. How were the mesocosms immersed in water exactly? It is stated that some tests were performed with both treatments (immersed + thrusters), but the text doesn't agree with figure 6 caption. (Fig 6c or 6d is immersed?)

P6.1 “while immersing in water the mesocosms” should be “while immersing the mesocosms in water”

P6.27 The accumulation of sediments is not necessarily a disadvantage. It depends on what processes or parameters you intend to measure. For example, the resuspension of normally sedimenting POM can increase the rates of attached bacterial degradation in the water column which would not have happened normally. Thus, if this is what you intend to measure, an artificially mixed tank will bias your observations, although I agree that an homogeneous tank can be appealing under other circumstances.

Section 2.3.1 Is the propeller upwelling or downwelling water through the center of the

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tank? How could that difference affect mixing and or sedimentation? (Slower center-upwelling thruster could allow some sedimentation depending of the mesocosm shape because of the downwelling on the edges.)

P7.22 & P7.28 Repetition.

On many occasions, in-text citations are not properly reported or oddly inserted (too many parentheses, misplaced commas, etc). Please fix.

In-text figure citation should of figures and figures labels could be improved.

P2.18. The sentence has no parentheses at the end. (i.e That make . . .

P2.22 Temperature control is probably the primary challenge with on-land mesocosm experiments due to the thermal inertia of the aquatic environment (Leblud et al., 2014).

P4.23 Odd sentence.

Fig6 caption: Please consider plotting all the graphs using the same y-axis. Also revise caption and y-axis label.

P5.33 “inmersing” should be immersing.

P6.2 Figure 6 e) appears twice

P6.6. What do you define as the “instantaneous variation of maximum temperature”?

P6.6-11 What is the mean temperature change under each scenario? Is stratification affected by the mesocosm immersion ?

P6.14 The appropriate speed to eliminate the stratification could be saved for the next section (on thruster velocity).

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