

Biogeosciences Discuss., referee comment RC2  
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## Comment on bg-2021-128

Anonymous Referee #2

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Referee comment on "Using an oceanographic model to investigate the mystery of the missing puerulus" by Jessica Kolbusz et al., Biogeosciences Discuss.,  
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### GENERAL COMMENTS

This paper explores the influence of factors associated with the Leeuwin current (LC) and the Capes current (CC) in explaining the breakdown of the historical relationship between recruitment of western rock lobster recruitment and the strength of the LC. To do so, they use a series of GAMs to model the best predictors of the settlement index at 8 sites and pars of the settlement season. The predictors explored are associated with oceanographic parameters describing the LC and CC, as well as cross shelf transport and a breeding stock index.

Overall, this is a useful paper that will be useful to rock lobster fishery managers. However, because the paper is exploratory, there is a lot of complex information and the main goals and takeaway point a get lost. The work itself appears to be solid, but is presented a little unclearly. I think a revision paying close attention to outlining specific goals in the introduction and structuring the paper around those goals could help. I also recommend revision for both grammar and to improve readability by making the writing more concise.

### SPECIFIC COMMENTS

- The introduction does a nice job of introducing the study system, but it does not introduce the impetus for the hypotheses well. For instance, why did the authors choose to explore specifically KE and EKE (lines 116-117). This is discussed in the results/discussion, but is not introduced. I want to be convinced that these are useful parameters to explore—not simply that they are ones that can be examined. This could be a way to set up more specific aims of the paper. Similarly, the authors have chosen to report a combined results and discussion section. I actually think the paper may be

more clear if these are separate—there were many paragraph in this section that were simply reporting of results with no discussion. This made the main points of the discussion get a little lost.

- Figure 2: a set of photos would be better. Additionally, the figure does not capture what is written in the text well. For example, the 9 stages are not noted and the timelines indicated on the figure and in the text (line 51) do not match well. These also do not match the methods well (ex: line 182/183).
- Line 207- 208: I am unclear what you mean by the temperature of the top 100m of the assumed phyllosoma distribution. Does this mean the top 100 m of the water column (and that is the assumed distribution), or some other depth that is the top 100 m of their deeper distribution. Also, is there a reference for this assumed distribution or is this your assumption?
- Section 3.4 My understanding is that the authors fitted 16 different GAMs. I would call this section “generalized additive modeling” or something similar instead. It is also not clear what the response variables in the 16 models actually are though. The results (fig 10) say “settlement”—I assume this is the purlieus index? (it is clear that this is both for the late and early season and all sites in the figure and the methods). Similarly, I am confused by why the GAMs were limited to linear relationships (line 238). Why use GAMs then? Can you please clarify?
- Figure 5: this could be labeled more clearly. First, the x axis appears to be year, not season. Second, it would be more clear to have they axis of b labeled as “offshore temp (top 100 m). In the figure heading, I am unclear about how that season is defined as January – December. Isn’t that the whole year? Finally, I suggest labeling the y axis for c as “Spawning Season Temp (bottom).”
  - Fig 5-9: I also think it would be useful to shade the years of low PI as in other figures.
- While I quite like Figure 10, you need to have the details of the models and model selection proecss in an appendix at the very least.

## TECHNICAL COMMENTS

- Figure 1a Legend—third sentence is incomplete
- The entire manuscript should be edited for comma rules to improve readability. I saw comma mistakes throughout that made sentences hard to read.
- Extraneous parentheses in line 135
- Table 1: I don’t understand the coding in the hypothesized relationship column.
- Fig 4; the abbreviations (ABR, PBK, etc) should be defined in the figure legend. Are these arranged by latitude? This could be included as well.
- Line 303-305 is an odd sentence structure
- Figure 6-8 : Here the x axes are year, not season
- You may consider combining Figures 6 & 7 into one figure since they are discussed together. I found I kept looking at the wrong figure and combing them into one with clear labeling and different coloring may help.
- Line 239: extra “An”
- Line 344: that instead of which. This sentence is also oddly phrased and should be broken into two sentences.
- Fig 11 legend. Delete the extraneous “model”

- Line 412: extraneous period at the end of the sentence
- Line 422: I assume 201109 should be 2009
- Line 470: "that" instead of "which"