

Interactive comment on “Potential effects of deep seawater discharge by an Ocean Thermal Energy Conversion plant on the marine microorganisms in oligotrophic waters” by Mélanie Giraud et al.

Anonymous Referee #2

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General Comments: In this paper the authors attempt to bring out the hypothetical impact of a hypothetical OTEC plant operating in the offshore region of Caribbean coast of Martinique with the help of numerical model using ROMS and microcosm experiment. Allow me to come to the point straight without any prelude. The manuscript is lost in too lengthy technical details of methodology, most of which is not new and used by several researchers in the field that the authors themselves quote as reference. It is very difficult to read the manuscript, trivial and redundant at times, too many qualitative statements, and contains several contradictions (see specific comments). The manuscript looks more like a technical report than a well articulated scientific paper with sound hypothesis with strong rationale supported with robust data analysis. The

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results reported are too general and in my view not substantial (see specific comments) to merit its publication in a peer reviewed scientific journal.

I cannot recommend publication of this manuscript.

Specific Comments:

There are several contradictions and flaws, but I point a few:

1. Title suits more for a technical report.
2. The 17 lines Abstract do not bring out substantial result. The result that is reported in lines 20 to 24 and in lines 24-26 are too general and trivial.
3. Line 29: It is not “bottom” it is “subsurface”
4. Line 37: How narrow?
5. Lines 49-55: Textural material. Unnecessary.
6. Line 56: How low?
7. Lines 57-59: This is a well known fact. Authors need not have to remind the readers. Delete it
8. Lines 61-63: Is this the rationale for the present study? I am not convinced. Authors need to do a better job so that the readers may find it interesting.
9. Lines 91-95: Fjords are very different system in terms of its dynamics as well as its ecosystem. How is this result relevant in the present study which deals with tropical system? The lengthy list of references in this para only serves to increase the volume.
10. Under Materials and Methods

Lines 110-128: There is a miss-match between the period during which the model is forced using dynamic variable and the period of the mesocosm experiments. How justified are the authors to compare the model simulation with mesocosm both being for

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different periods without any consideration/justification about the inter-annual variability.

Interestingly, and conveniently in the later part of the manuscript the authors attributes the difference between the observation and model to inter-annual variability (Lines 263-266).

Quite contradictory to this the authors very conveniently concludes in earlier para (lines 241-260) that “modelled physical properties were therefore quite similar to those directly observed”

11. Under Results

Lines 241-260: The model simulated temperature profile has a warm bias of 1.5oC in the upper 50m and cold bias of 1.5oC between 300 and 500m in June. A similar over estimation is also seen in the model salinity in the upper 60m which was as large as 2 units. Similarly, in November also the temp showed a warm bias, however, the salinity was under estimated. The problem of the model is not limited to T and S, the sub-surface current speed also showed large deviation from that of ADCP (lines 261-262).

In spite of such deviations between the model and observation authors conclude that modelled physical properties are quite similar to observation (lines 263-264) which is unacceptable and I disagree. Authors need to do a better job.

12. Under Conclusion Lines 537-555: What is the important “take-home message”? “The phytoplankton community and its production could be impacted by a large deep seawater input”? (lines 548-549)

13. Other major concern is the utility of the present study which is limited to such a small spatio-temporal scale and its impact/relevance in the context of the open ocean processes such as mixing aided by the air-sea flux variability driven by the winds.

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