

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 #1

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Giraud et al examined the potential effects of discharging the cold nutrient-rich deep seawater on the phytoplankton community before the real installation of OTEC pilot plant. Part of the purpose of evaluation is to find a suitable depth where the deep seawater could be discharged without significant effect on the surface phytoplankton community. The effects of discharging seawater is roughly evaluated in two aspects: the thermal effects and their impacts on phytoplankton community. It is a valuable work to evaluate the potential environmental assessment before application of artificial project. However, there is some weaknesses of this paper relate to the validity of the interpretations and implications of the results obtained. 1. The thermal effects of discharging seawater at different depths that a temperature difference of 0.3 °C

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and less than 1 km² on the area was achieved using ROMS- Regional Ocean Model system. The validity of the Model was proven by comparing the modeled temperature, salinity and currents profile with the CTD and ADCP measuring data. However, the comparison between modeled data and in-situ measured data are from different years. Besides, the temperature bias between the modeled data and the in-situ measured data are much higher (~1.5 °C) than the simulated thermal effect (~0.3 °C) caused by OTEC discharging, although author concluded in Line 263 that the modeled physical properties (T, S, Currents) were quite similar to those directly observed at the study site and attributed the differences to inter-annual variability. 2. The purpose of using ROMS- Regional Ocean Model system is to check whether discharging deep seawater would change the phytoplankton community, especially in the surface layer. Since the lowest discharging depth is about 45 m, which is the maximum Chl a depth, the cold deep seawater would mixed with ambient seawater after discharging. whether the mixed water would sink out of thermocline layer is decided by the density. Thus, salinity is also important to check the effect. However, in the result part, the authors did not give the salinity effects caused by discharging, which we believe is an indispensable part.

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