Response to Reviewer N°1
Referee's comments are in italics below.

1. The thermal effects of discharging seawater at different depths that a temperature difference of 0.3 °C and less than 1 km^2 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 ïij´L0.3_CïijL'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.

The only measurements available on the OTEC future location off the western coast of Martinique are those presented in our manuscript, acquired during our field effort (November 2013 and June 2014). At the time of our study, the NCEP-CFSR products did no cover the period of our mesocosm experiments. So, we chose to run our model over another period when the atmospheric forcing was available. We chose the 3 years period of 1998-2000, using 1998 and 1999 as a spin-up and the last year 2000 to analyze the thermal structure and circulation field. The thermal structure (depth of thermocline and temperature profile, intermediate and deep waters temperature) is well mimicked despite a slight bias in the very surface due to interannual variability in the atmospheric forcing. The reasonable agreement in the thermal structure allows us to be confident in the estimation of the thermal impact of the OTEC discharge. We agree with the referee about the bias in salinity.

Salinity field data at the OTEC site showed large seasonal variations, with low values in June 2014 (34.6 on the top 50 m) and much higher values in November 2013 (35.5 on the top 50 m). The model run for year 2000 did not fully reproduce these variations. The observations we made at the OTEC station showed that the low salinity observed in June was associated with high $Si(OH)_4$ concentrations. High $Si(OH)_4$ levels in fresher seawater have been already reported in surface waters in the Caribbean Sea and they were attributed to Amazon and Orinoco fresh rivers inputs. Fresh surface waters enriched in $Si(OH)_4$ can be transported from the Amazon and Orinoco rivers towards the Caribbean Sea by the North Brazil Current and the Guiana Current (Muller-Karger et al., 1988, 1995; Osborne et al., 2014, 2015). It is likely that the rivers discharges and thus its inputs in the Caribbean Sea were quite different between 2000 (modeled year) and 2014 (in situ observations), thus explaining the discrepancy between modeled and observed salinities. Meso- and submesoscale features resulting from the rivers flows could also induce short-term variability in the area and then could explain the observed differences.

We propose to reformulate lines 263-265 as follows:

The fit between modeled physical properties (temperature, salinity, currents) and those directly observed at the study site is not perfect due to interannual variability in atmospheric forcing and freshwater inputs by the major rivers but also to meso- and submesoscale variability present in the region. However, the estimation of the thermal impact of the OTEC discharge which is our major objective here can be considered with confidence since the thermocline and halocline depths, key proxies for oceanic mixing, are well mimicked in June and November.

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.

We fully agree with Referee N°1 that density should be looked at. In fact, we had looked at it but since we were focusing on the thermal impact on phytoplankton growth, we had decided not to mention it since the impact was also minor. As far as we know it, there are no environmental standards defining threshold levels for density difference that will be induced by an OTEC deep seawater discharge.

The density of water being discharged at 45 m, depth of the deep chlorophyll maximum (DCM), is 27.48 (8°C and salinity of 35). The density of water at 45 m is around 23.72 (temperature of 28°C and salinity of 36.5) so we have a nominal gradient of 3.76 in density. If we consider a modification of the density structure of the top 150 m of the water column of $|\Delta\rho| \geq 0.1$, there is no impact when the discharge occurs at the depth of the DCM. If we consider a lower density difference of 0.05 (absolute value), the area exhibiting a $|\Delta\rho| \geq 0.05$ in the top 150 m is extremely small (< 1.5 km^2) in both sections at the depth of the chlorophyll maximum, on an annual average and in June (our experimental period). This represents less than 1.5 % of the nominal density gradient.

We propose to insert the following section after line 288 (just before Section 3.2):

The density of water being discharged at 45 m, depth of the deep chlorophyll maximum (DCM), is 27.48 (8°C and salinity of 35). The density of water at 45 m is around 23.72 (temperature of 28°C and salinity of 36.5) so the nominal density gradient is of 3.76. If one considers a modification of the density structure of the top 150 m of the water column of $|\Delta\rho| \geq 0.1$, there is no impact when the discharge occurs at the depth of the DCM. If one considers a lower density difference of 0.05 (absolute value), the area exhibiting a $|\Delta\rho| \geq 0.05$ in the top 150 m is extremely small (< 1.5 km^2) in both sections at the depth of the chlorophyll maximum, on an annual average and in June (our experimental period). As far as we know, there are no environmental standards defining threshold levels for density difference that will be induced by an OTEC deep seawater discharge. This represents less than 1.5 % of the nominal density gradient so as for the thermal impact the impact is estimated to be minor.