Response to Reviewer 2

We would like to thank Reviewer 2 for providing constructive and insightful comments. We will incorporate their suggestions into a revised manuscript. Reviewer 1's comments have been reproduced below in black, with the authors' response in blue.

General comments

However, there are some short paragraphs that contain only one sentence. I suggest the authors consider re-organize some of the paragraphs.

To solve this problem we merged section 2.5 and 2.6 that now is called: "CO_2 optode lag and drift correction and calibration" and section 3.1 and 3.2 than now is: "O_2 and CO_2 optode calibration"

My major concern is about oxygen optode calibration. It is unfortunate that discrete oxygen samples were not collected. But I am not convinced that archived oxygen data dated back to 2000 are suitable to be used for calibration even for deep water. The authors may justify this by demonstrating that the changes in archived oxygen data over the past 20 years are minor. Otherwise, the most recent discrete oxygen data should be used for calibration.

In the revised version we will add in the appendices Figure 1, the figure shows that the oxygen discrete samples variability is within the variability of the measured oxygen by the glider. For that reason, the interannual and seasonal variability of the discrete samples can be considered minimal. See also reply 9 to Reviewer 1.

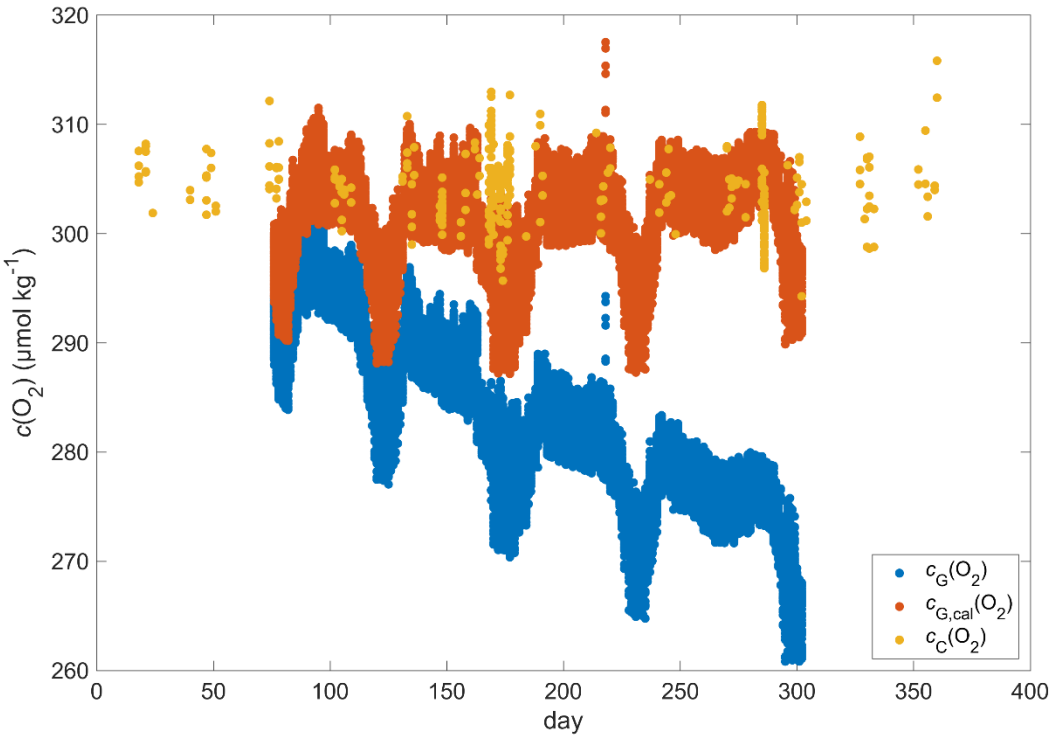

Figure 1: a) Discrete samples $c_C(O_2)$ (yellow), raw glider oxygen $c_G(O_2)$ (blue) and drift corrected glider oxygen $c_{G,cal}(O_2)$ (red) using water density > 1028 kg m^{-3}.

Also, Figure 2 shows that the oxygen discrete samples in this water mass do not change between 2000 and 2010. For example, $c(O_2)$ in 2000 varied from 299.5 to 314.3 µmol kg^{-1} and in 2009 from 300.6 to 312.7 µmol kg^{-1}. For that reason, we can consider the oxygen concentration constant during the years and can be used as reference to correct the oxygen optode.

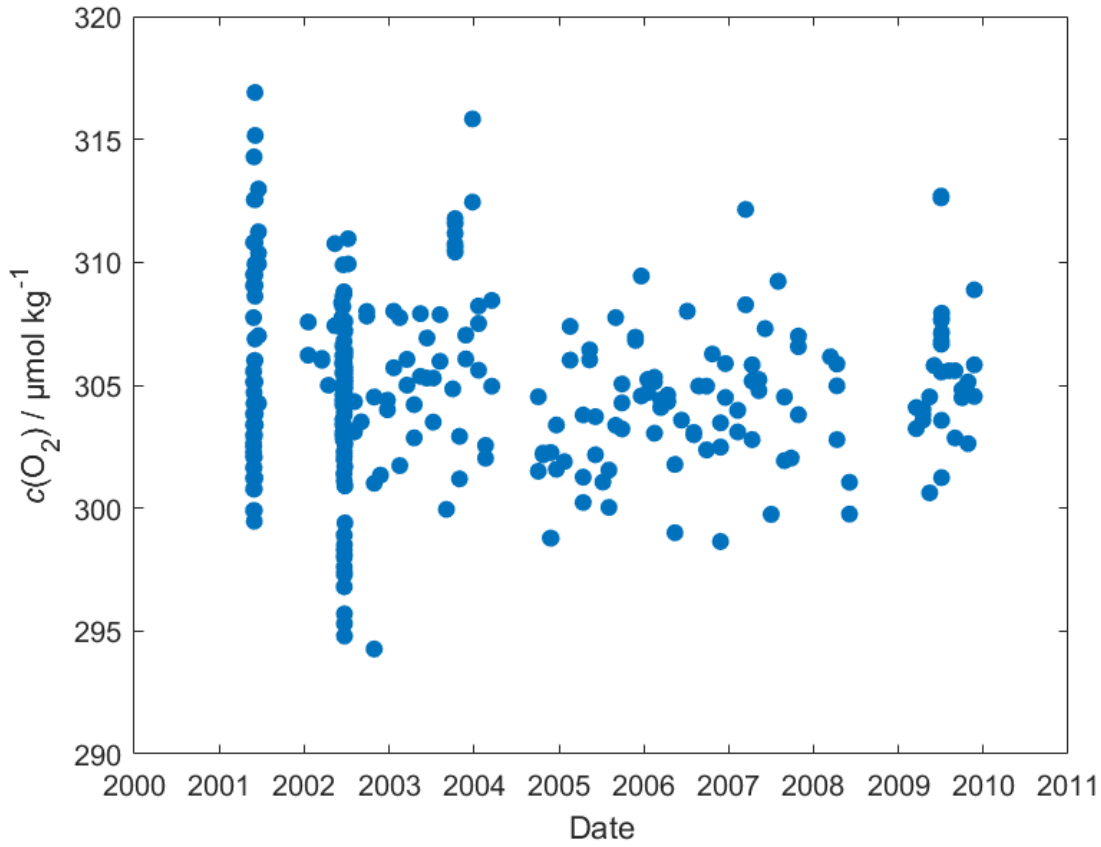

Figure 2: oxygen discrete samples used as reference to calibrate the oxygen optode output. All the samples were collected in the latitude and longitude range of the deployment area for a water density > 1028 kg m^{-3}.

One major advantage of glider is that it can survey the entire water column continuously. However, the major portion (sections 3.3-3.6) of the results section is on NCP data at an integration depth of zlim = 45 m (figures 14-16). This compromises the importance of using glider data.

In all the manuscript we correct and show the entire profiles for oxygen, CO_2, temperature, salinity and chlorophyll. The net community production was calculated using an integration depth of 45 m because it was the mean depth of the euphotic zone. The two *N*s were 4.6 and 0.5 mol m^{-2} a^{-1} for $N(O_2)$ and $N(C_T)$, respectively. For comparison, we calculated net community production using integration depths of 30 and 100 m. The derived net community production was the same for $N(O_2)$ at the different integration depths and similar for $N(C_T)$. In particular, $N(C_T$; 30 m) was 0.6 mol m^{-2} a^{-1} and $N(C_T$; 100 m) was -0.04 mol m^{-2} a^{-1}; $N(O_2$; 30 m) was 4.6 mol m^{-2} a^{-1} and $N(O_2$; 100 m) was 4.3 mol m^{-2} a^{-1}.

Specific comments

Lines 68-79, I think these two paragraphs belong to the method section.

We moved the two paragraphs to the method section, creating a new introductory section (2.8) to the net community production.

Line 348, it should be k(CO2) rather than k(O2) in equation 14.

We changed the equation replacing $k(O_2)$ with $k(CO_2)$.

Line 609, change “a sink to” to “a sink of”

We changed “a sink to” to “a sink of”.

Figures 2, 3, 8, 9 Date on the x-axis is kind of misleading. It seems like Jan-04, Jan-05, etc. I think it is better to change 01/04, 01/05, . . ., 01/10 to April, May, . . ., October.

We changed the date to the suggested date format in figures: 2, 3 and 6 to 16.