

OS-2020-115 Response to the anonymous referee

The original referee comments are shown in black and the author responses in red. We thank the referee for the comments.

The page / line numbers refer to the clear version.

It is not clear where the micro-meteorological flux tower is located. Is it near “D”, the Marine Station?

We added a clarification in the sentence in the line 23 in the page 3:

“The micro-meteorological flux tower at the western shore, next to the marine station, measures the CO₂, sensible heat and latent heat fluxes between the sea and the atmosphere.”

P7L07 “on average seawater cooled on its way from the inlet to the lab by 0.4 ± 2.0 °C” Is it correct? The variability exceeds the observed trend. In this case I would write something as: “the difference in temperature oscillates within ± 2.0 °C”

The variability indeed exceeds the observed trend, and thus we rewrote the sentence in the line 7 in the page 7 accordingly:

“The difference in temperature oscillates within ± 2.0 °C.”

P9L30 please, add temperature and salinity to the parameters used for CO2SYS calculations.

We added the mention of temperature and salinity to the parameters used for CO2SYS in P9L30:

“First, the carbon chemistry is calculated in CO2SYS for each hour based on the measured partial pressure of CO₂, parameterized total alkalinity (see above), temperature and salinity.”

P12L08 – 12 The oxygen trend was already described at lines 1-4. I suggest to reorganize these lines to avoid repetitions that can generate confusion.

In the lines 1-12 in the page 12, the pCO₂ and O₂ conditions are described in chronological order, starting from July 2018 and ending in June 2019. The sentence starting at P12L12 is a conclusion of the whole study period, and to emphasize this, now this sentence starts a new chapter.

We rewrote the sentence starting in P12L8 in order to emphasize that it concerns the winter:

“Also, thorough the winter, the sea was mostly a sink of oxygen and the measured oxygen concentration predominantly increased.”

P19L08 “disabled the oxygen flux between the atmosphere and sea” What does it exactly mean? That you calculated the biological pCO₂ variation assuming that all the changes in oxygen concentrations are due to production /rem mineralization. Is it correct?

That’s correct, disabling the oxygen flux between the atmosphere and the sea means that all the variation in oxygen is assumed to originate from the biological transformations. We added a clarification in P19L8:

“- - we performed a similar analysis as in Fig. 9 but separately disabled the oxygen flux between the atmosphere and sea (i.e. assuming all oxygen changes to originate from the biological transformations), - -“

In addition to the changes listed above, we added an acknowledgment for the referees in P29L6:
“We thank the referees for their insightful comments resulting in highly improved manuscript.”

Best regards,

Honkanen et al.