

Dear editor, kindly find below my responses to the reviewer comments received. Thank you for the handling of our paper, it has been an excellent process Ruth, on behalf of the co-authors.

Detailed comments:

L183: check the subsection numbering, it shows 2.82 instead of 2.1, check throughout the entire text, i.e. L231 etc.

**FIXED**

L196: not sure what the track change is meant to be here – worth checking

**I'M NOT SURE WHAT THE FORMATTING ISSUE IS, BUT THE TEXT IS AS WHAT I EXPECT**

L223: check track changes – it looks like some formatting error

**AS ABOVE**

L254: can authors maybe add a citation or link to the table for the Express Mode settings of Eddy Pro

**I'VE PROVIDED THE LINK IN THE TEXT**

L273: It is not clear if the authors applied a common method to assess the friction velocity threshold or if they applied a threshold value “typically used in EC studies” (citing a study from a 447m tall tower) – which is itself not a correct statement. A friction velocity threshold needs to be determined for each site individually and can range from 0.1 to 0.5 m.s<sup>-1</sup> or higher (see Chapter 5 in Aubinet, M., Vesala, T., and Papale, D. (Eds.): Eddy Covariance, Springer Netherlands, Dordrecht, <https://doi.org/10.1007/978-94-007-2351-1>, 2012.).

The widely applied method now to determine u\* thresholds is the Change Point Detection method after Barr (2013):

Barr, A. G., Richardson, A. D., Hollinger, D. Y., Papale, D., Arain, M. A., Black, T. A., Bohrer, G., Dragoni, D., Fischer, M. L., Gu, L., Law, B. E., Margolis, H. A., McCaughey, J. H., Munger, J. W., Oechel, W., and Schaeffer, K.: Use of change-point detection for friction-velocity threshold evaluation in eddy-covariance studies, *Agricultural And Forest Meteorology*, 171, 31–45, <https://doi.org/10.1016/j.agrformet.2012.11.023>, 2013.

**I'VE CHANGED THE SENTENCE TO HIGHLIGHT WE USED THIS METHOD AND ADDED THE REFERENCE. THE REFERENCE I USED EARLIER WAS TO THE METHOD NOT THE NUMBER, BUT IT WAS NOT CLEAR TO THE READER.**

L276 & Table 1: It's good to see the table of data coverage which makes the study and more transparent. However, it would be good to show where the 90 days for growing season and 18 days for dormant season data is coming from. Given the widespread intermittent coverage, it's not clear from which time period (i.e. month and year) these explicit selected days are coming from. This related to L467: “reflecting several phenological stages” – given the variability, it might be good to show a boxplot or depending on the spread of the 90 days across several phenological stages – it might be interesting to see differences in daily NEE corresponding to phenological stages.

**I'VE ADDED THE SEASONS AS A SPEARATE COLUMN (AND REMOVED COLOUR). UNFORTUNATELY AT THIS POINT I DON'T THINK THERE'S ENOUGH DATA TO BREAK IT DOWN FURTHER TEMPORALLY, BUT THIS WOULD BE AN AREA OF INTEREST FOR ME.**

L312: 1800 seconds which is 30 min, i.e. as data interval.

**NOW READS: 'The trapezoid rule approximates the total flux by dividing the day into smaller intervals, each lasting 1,800 seconds (30 minutes). For each data interval...'**

L320: GPP instead of GEP, the paragraph is a bit confusing and needs clarification, see below.

**CHANGED GEP TO GPP**

L387: better to say night time only ecosystem respiration.

Paragraphs starting L320 and L387: There is the seeming assumption that night-time RE is the same as day-time RE. While mentioned earlier that partitioning was not possible, this is a partitioning (the night-time approach using night-time RE and temperature relationship), i.e. calculate RE based on the temperature relationship, so to get estimates for the daytime (based on daytime temperature) which then get subtracted from NEE to get GPP. RE is usually higher during day-time than night-time due to higher temperatures, which is also reflected in the seasonal changes, i.e. RE is higher in summer than winter due to temperature. Thus, taking nighttime RE to

get a daytime GPP estimate is problematic. It would be better to exclude the part relating to GPP (or GEP), as it is not further discussed.

**I HAVE REMOVED THIS SECTION, IT NOW READS "For the CO<sub>2</sub> budget, Net Ecosystem Production (NEP), was defined as NEP=-NEE. Nighttime NEE is referred to as R<sub>e</sub> and was corrected for temperature effects on respiration using a an exponential Arrhenius-type relationship (Lloyd and Taylor, 1994). "**

Admitting the RE-temp relationship is not good; Why has the data been selected between 22:00 and 2:00 am? Did authors used the u\* filtered nighttime NEE and/or tried to use only the first 3 hours after sunset (i.e. van Gorsel method, van Gorsel et al., 2007) to see if the relationship improves?

van Gorsel, E., Leuning, R., Cleugh, H. A., Keith, H., and Suni, T.: Nocturnal carbon efflux: reconciliation of eddy covariance and chamber measurements using an alternative to the u<sup>(\*)</sup>-threshold filtering technique, Tellus B: Chemical and Physical Meteorology, 59, 397–403, <https://doi.org/10.1111/j.1600-0889.2007.00252.x>, 2007.

**WE SELECTED THE DATA TO BE UNIFORM THROUGHOUT THE YEAR AND SUMMER DAYS ARE VERY LONG. DUE TO THE HIGH LATITUDE LIGHT LEVELS AFTER SUNSET (TWIGHLIGHT) ARE HIGHLY VARIABLE ACROSS SEASONS SO OUR APPROACH WAS SELECTED TO ENSURE DARKNESS.**

L329: please correct instead of "a linear slope of the relationship": "... an exponential Arrhenius-type relationship (Lloyd & Taylor, 1994) ..."

**CORRECTED AND REFERENCE ADDED**

L335-336: better to remove the confounding phrase "which has a relatively short growing season during the summer" if the growing season is Oct-May

**REMOVED**

L355: Thanks for the season clarification. It would be better to just colour the growing season as somehow the colouring of the seasons in the figure does not always seem to align with Oct-May and June-Sep.

**IN THE ORIGINAL IMAGE I'VE ONLY COLOURED THE PERIODS WE ARE USING DATA FROM, NOW I HAVE UPLOADED A NEW FIGURE COLOURING ALL PERIODS BY SEASONS.**

Fig.3: It would be good to improve this figure, i.e. splitting each panel into years (2020 & 2021), to avoid this big gap in between data point clouds – that way the data will be better visible.

**FIGURE 3 WAS CHANGED AS PER RECOMMENDATIONS**

L426 & Fig. 6a: This is in a way the Lasslop approach for NEE partitioning using day-time data with the y-intercept is the respiration value for daytime – something to consider for the authors.

**THANK YOU**

L505: be mindful of consistency of acronyms, i.e. Tair or TA or airT, same with SW radiation or Rad,...

**FIXED**

L512: instead of carbon budget use daily carbon fluxes

**FIXED**

The authors explained well in the reviewer response why the changes in the water table were not considered, which would be important to briefly include in the material and methods.

FIXED, now reads “Western Port has semi-diurnal tides with a range of nearly 3 m, resulting in wide intertidal flats occupied by mangroves of the species *Avicennia marina* and saltmarshes. The saltmarsh in this study experiences complex hydrological conditions, and we found that inundation does not directly link to tides. “