

***Interactive comment on* “Distribution and cycling of terrigenous dissolved organic carbon in peatland-draining rivers and coastal waters of Sarawak, Borneo” by Patrick Martin et al.**

Anonymous Referee #2

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Martin et al. explore the spatiotemporal variations of dissolved organic carbon (DOC) and colored dissolved organic matter (CDOM) using in-situ data obtained from a total of six peatland draining rivers and coastal zones in Sarawak. The photo-liability and the cycling of these riverine DOM are also further investigated and discussed by conducting field photo-degradation experiments. Although some of phenomena and conclusions presented in this work are not new in this region or elsewhere, it's valuable to have seasonally-resolved DOC measurements in this important tropical marine biodiversity hotspot area. Overall, the data obtained in “black waters” are very interesting and the overall quality of the study is positive and contributes to a better understanding of the DOM properties in a region that accounts for a large fraction of DOC export

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to the global ocean while also facing strong anthropogenic influences; however, the manuscript needs some improvements in the text and figures.

Specific comments and suggestions for further improvements: The authors spent 5-pages to describe the Materials and Methods part, which is much longer than the results. Some of the methods described are not new (e.g., section 2.2.1 and 2.2.2 for measuring DOC concentration and CDOM absorbance), and can be properly shortened. Regarding the precipitation data in Fig. 1a, you may consider to highlight the locations of meteorological stations using corresponding colors in Fig. 1b-1d.

Regarding the section 2.2.3 of conservative mixing model, you may consider giving more details about the procedures using a table or other means.

Page 6, line 30, can you add a reference here and describe a bit the advantages of adding NaN₃ to DI water as blank?

Page 7, line14, absorbance should have no unit. Also, page 7, line 1 – NaN₃ absorbances around 26 m⁻¹ at 230 nm, 4 m⁻¹ at 254 nm: shouldn't these be absorption coefficients? These are very large values and likely to influence SUVA values.

Page 11, line 21-25, can you describe more about the highly scattered data in range of 2.5-3.5 of log DOC (Fig. 5b) and 1.0-2.0 of log S₂₇₅₋₂₉₅ (Fig 5c) (e.g., geolocation of the scattered data) since you mentioned that no strong seasonal changes in DOM composition within your study region in discussions; Page 16, line 17-18), which contradict a bit with the results here. In addition, you may consider to keep same scale of these parameters in Fig. 5 instead of using log scale for some parameters.

Regarding Fig. 6, can you specify the black and yellow symbols in figure caption? Also, page 11, line 27, it is written that both "...DOC and CDOM decreasing after sunlight exposure" however, Figure 6 and Table 1 do not show CDOM absorption values. It would be important to also show the relative decrease in CDOM at 350 nm with light exposure. Figure 6 is also repeated in supplementary S3.

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Page 13, line 10-15, it might not accurate to rule out a major autochthonous source of DOC just according to low surface Chl a concentration since the DOC fluxes from benthic flora to the overlying water column might also be another possible reason for high DOC in shallow estuary.

Page 14, line 10-14 “the high precipitation in Maludam in September DOC concentrations” which is not clear to me and I am wondering if there is previous study that reported this phenomenon; if yes, you may want to add a reference here. In addition, the lower DOC concentrations mentioned there could probably be associated with other environmental factors. The hydrological and meteorological conditions during wet and dry season could be different, which will change the residence time of waters and solar radiation, further affect DOC and CDOM properties there.

The authors may consider mentioning the conservative mixing model in the abstract and conclusions since the model was used to “validate” their DOC and CDOM measurements in the result for several times. In addition, it’s better to describe the advantages or reasons to include this model in this work, so far, it looks weakly linked to other parts.

Regarding Table 1, please keep the font size and typeface consistent and change “*” to “x”.

It would also be valuable to provide more information on the six rivers regarding their size, length, drainage basin, discharge, etc.

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