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Interactive comment on "Distribution, seasonality, optical characteristics, and fluxes of dissolved organic matter (DOM) in the Pearl River (Zhujiang) estuary, China" *by* Yang Li et al.

Anonymous Referee #3

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Distribution, seasonality, optical characteristics, and fluxes of dissolved organic matter (DOM) in the Pearl River (Zhujiang) estuary, China Yang Li et al.

This work presents the seasonal distribution (May, Aug, Nov, and Jan 2015) of DOM (DOC concentrations, CDOM absorption and CDOM fluorescent components (from PARAFAC analysis) in Pearl River estuary (PRE), China. DOC concentrations and CDOM absorption and fluorescence properties (and their qualitative metrics) were examined in relation to salinity as well as to each other. In addition, fluxes of DOC and CDOM from the PRE to South China Sea were also estimated. Overall, results of this study provides new insights into the seasonal DOC and optical properties of CDOM

in PRE. In comparison, most previous studies have mainly reported one or two field campaigns, while this study comprised a more seasonal study (four field campaigns). However, the analysis of the data throughout involves simple correlation analysis and is descriptive with no rigorous analysis of field data (spatial analysis, precipitation, chlorophyll and turbidity measurements that were indicated in the text to have been measured). The additional analysis would support a better understanding of the sources and sinks related to the DOM in PRE. I find that the manuscript needs further improvements and the authors should address some major concerns/suggestions before the paper can be accepted for publication.

Major comments/suggestions: 1) There are various major sources of freshwater to the PRE. Previous studies have also indicated spatial differences in the surface and bottom properties in CDOM optical properties (absorption coefficients and spectral slope; e.g., Lei et al. 2018). Furthermore, seasonal analysis of DOC (Ye et al. 2018) indicated strong seasonality in DOC with substantial removal of DOC in the salinity range 5-22. I think a more comprehensive analysis using all the available data (e.g., chlorophyll, turbidity, etc) including spatial distribution plots (surface and bottom) would greatly help in supporting the conclusions of this study.

2) Throughout this study the authors describe the data collected in the main estuary as the saltier zone as opposed to fresh water zone. I think a more traditional separation of the zones (e.g., Cai et al. 2004; upstream region, estuary, outer estuary) would be more appropriate and could better support the results of this study.

3) The absorption coefficient at 330 nm used in this study has not generally been used and therefore not easily comparable to other studies. Although Table S1 includes some of these wavelengths, it would help if the authors replace the absorption at 330 nm with another commonly used wavelength. Also the spectral slope between 275-295 nm is now generally used to assess CDOM properties and should be included in the analysis.

4) CDOM generally is a good optical proxy for DOC, especially in estuaries. Also,

CDOM undergoes rapid photobleaching in the estuaries or the coastal waters. It may not be useful include estimates of CDOM fluxes at 330 mn from the estuary to the SCS, especially since the wavelength used is so unique to this study.

5) It may be useful to look at meteorological data (e.g., wind field) to see if mixing played a role in reducing the variability in DOM surface and bottom properties.

Minor comments: -No indication of how salinity was measured -Methods section could describe the study site rather than in the Introduction.

References: X. Lei, J. pan, A. T. Devlin. 2018. Mixing behavior of chromophoric dissolved organic matter in the Pearl River Estuary in sprig. Continental Shelf Research, 154, 46-54.

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