

The authors would like to thank Reviewer #2 for the valuable and detailed comments. The author's responses are in italics.

Response to Anonymous Reviewer #2

“This study presents a tuning of the well-known standard quasi-analytical algorithm (QAA, Lee et al., 2002) to improve its performance in optically complex and shallow estuarine waters. This tuning is based on both synthetic data and in-situ measurements. The improvement due the tuned algorithm (called QAA-V) is assessed based on once again synthetic data (Hydrolight computations) and in-situ measurements in several US coastal and estuarine waters. The performance of the tuned algorithm is proved to be reasonable so as the improvement when compared to QAA last version (v6). Finally, QAA-V is applied to VIIRS satellite data recorded over turbid coastal waters (Galveston Bay, Texas) to retrieve then map the particulate light backscattering coefficient at 532 (bbp_{532}) actually converted into suspended particulate matter concentrations (SPM) using an empirical relationship. SPM maps generated after an intense flooding event are analyzed using river discharge and wind speed/direction data. Overall, the manuscript presents a significant piece of work with interesting results. Moreover, it is well organized and written. The most convincing part is certainly the tuning of the QAA algorithm for shallow estuarine waters and the efforts made to validate the results obtained.”

Response: *We appreciate that the reviewer found this work interesting and significant.*

“The less convincing section is the retrieval and mapping of SPM concentrations in Galveston Bay using VIIRS satellite data as: QAA allows retrieving the light absorption and particulate coefficients of colored water constituents on top of pure water (a_{nw} and b_{bnw} , respectively), i.e. much more than SPM concentration. “One would expect maps of a_{nw} and b_{bnw} to be presented and analyzed at the end of the study that could highlight interesting spatial and temporal variations of CDOM and SPM composition and size distribution over the study area. My recommendation is to accept the manuscript for publication if the authors can address in more details this last comment, at least in the Discussion and Conclusions sections.”

Response: *Because we obtained reasonable estimates of backscattering coefficients from QAA-V processing chain, we decided to include in latter part of this study an application of QAA-V for investigating post-hurricane SPM dynamics in Galveston Bay. In the revised version, we show results of a_{tnw} and b_{btmw} maps for VIIRS and for additional ocean color and land observing sensors during our two field campaigns in Galveston Bay (Fig. S1). The same will be discussed briefly in “Results” and “Discussion” Sections. In a separate study, we are presenting a more detailed analysis of CDOM and particulate absorption dynamics and fluxes associated with Hurricane Harvey.*

“Page 6 SPM uncertainty? Sensor used for bbp measurements and data processing/corrections?”

Response: *We did not have the replicates of SPM measurements, therefore uncertainty in sample collection and filtering process is unknown. However, the uncertainty in weighing scale measurement is ± 0.1 mg. We used the WETLabs VSF-3 (470 nm, 530 nm, and 660 nm) and ECO BB (532 nm) backscattering sensors for b_{bp} measurements (D'Sa et al., 2006).*

“Eq. 2: R_{rs} (residual)? Please define and justify”

Response: *Rrs* (residual) is attributed to residual sky-radiance. Generally, it is assumed that water-leaving radiance is zero at 750 nm in open ocean, which may not hold well in coastal and estuarine waters. We moved residual wavelength to 950 nm in this study with an assumption that water-leaving radiance is zero at 950 nm (Which may not be true in highly turbid regions of Galveston Bay such as near the Trinity River). We have updated text accordingly in the revised manuscript.

“Eqs. 1-3: provide physical unit for each parameter”

Response: *Units will be provided in revised manuscript.*

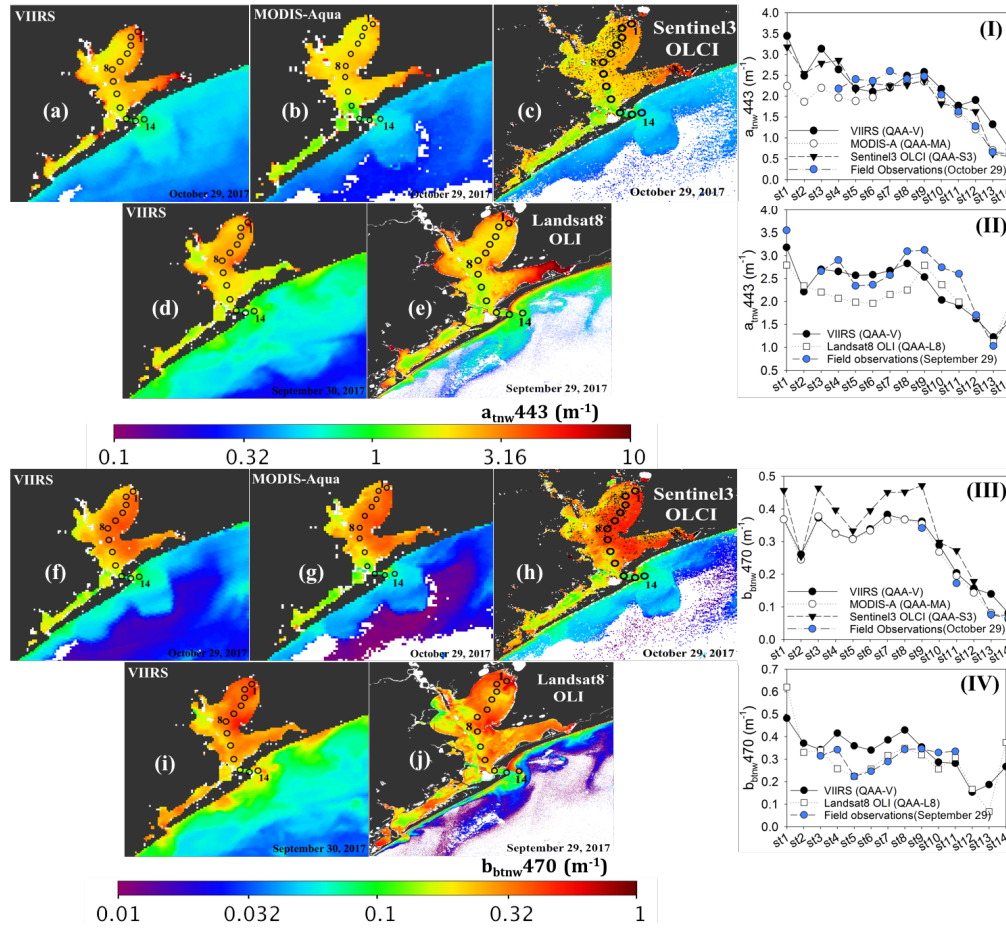


Figure S1: Application of sensor-specific QAA tuning to obtain the maps of a_{tnw443} using a) VIIRS, b) MODIS-Aqua and c) Sentinel3 OLCI on October 29, 2017, and d) VIIRS and e) Landsat8 OLI on September 30, 2017 and September 29, 2017, respectively. The validation of these maps with field observation along the transect (St. 1 to St. 14) is shown in (I) for figs. 8a-8c and in (II) for figs. 8d & 8e. The maps of b_{tnw470} were obtained similarly for f) VIIRS (October 29, 2017), g) MODIS-Aqua, h) Sentinel3 MSI, i) VIIRS (September 30, 2017), and j) Landsat8 OLI (September 29, 2017) with their validation results in (III) and (IV), respectively. Parameter values beyond the upper limit of tuned QAA ($\rho > 0.65$) is masked in white.

Reference:

D'Sa, E. J., Miller R. L., and Del Castillo C.: Bio-optical properties and ocean color algorithms for coastal waters influenced by the Mississippi River during a cold front, *Applied Optics*, 45, 7410–7428, 2006