Supplemental Material

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Coincident Observations of Dye and Drifter Relative Dispersion over the Inner Shelf
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Supporting Information for

Coincident observations of dye and drifter relative dispersion over the inner shelf

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The $K_d(490)$ estimates (Mueller, 2000; NASA, 2009) are a good general indicator of water clarity because the non-water optically active components of absorption and scattering can contribute significantly to the diffuse attenuation at that wavelength (while it is dominated by CDOM, phytoplankton or non-algal particulates at shorter wavelengths and by water absorption after ~570 nm). The diffuse attenuation at other wavelengths (in the absence of dye fluorescence) can be estimated from the Kd(490) determination (Austin & Petzold, 1986. See table and plot below). For the clearest waters of the study (Kd = 0.05 m^{-1}), this would put the penetration depth (z90 =1/Kd, the thickness of the water layer from which ~90% of the water-leaving photons come from, Gordon & McCluney, 1975) around 12 m for the excitation bands and around 5 m for the emission bands. For the more turbid waters (Kd = 0.333 m^{-1}), the 1/Kd depth for the excitation bands would be around 4 m and around 3 m for the emission bands. Note that the Kd algorithms used here were mostly designed for oceanic waters and likely underestimate Kd in turbid waters. However, the highest Kd(490) values considered here (~0.33 m^{-1}) remain relatively low and suggest conditions of limited turbidity in general so the algorithms may still be reasonably accurate.

Kd(490) = 0.05 m^{-1}

ex

λ(nm)	Kd(λ)	1/Kd(λ)
545	0.0787	12.70
550	0.0806	12.41
555	0.0843	11.86
560	0.0871	11.47

em

λ(nm)	Kd(λ)	1/Kd(λ)
590	0.1707	5.86
595	0.2137	4.68
600	0.2669	3.75

Kd(490) = 0.333 m^{-1}

ex

λ(nm)	Kd(λ)	1/Kd(λ)
545	0.2512	3.98
550	0.2464	4.06
555	0.2441	4.10
560	0.2416	4.14

em

λ (nm)	Kd(λ)	1/Kd(λ)
590	0.3077	3.25
595	0.3511	2.85
600	0.4056	2.46

References:

Austin, R.W. and T.J. Petzold, 1986. Spectral dependence of the diffuse attenuation coefficient of light in ocean water, *Opt. Eng.,* **25**(3), 471.

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Mueller, J. L. 2000. SeaWiFS algorithm for the diffuse attenuation coefficient, K (490) using water-leaving radiances at 490 and 555 nm, p. 24–27. In S. B. Hooker and E. R. Firestone [eds.], SeaWiFS Postlaunch Calibration and Validation Analyses, Part 3. NASA GSFC.

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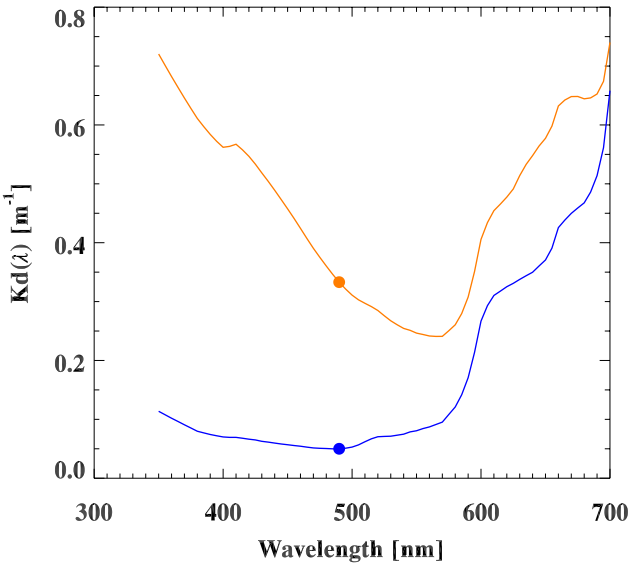

Kd spectra reconstructed from the Kd(490) values using the approach described in Austin & Petzold (1986) for the 2 extreme cases of 1/kd = 20 m (blue) and 3 m (orange).