

Supplementary Materials:

Figure 1. The study site is located along the lower Hackensack River in Lyndhurst, NJ, USA. The transect locations are depicted by T1, T2, and T3; these transects begin at the edge of the impoundment and end 20 meters inshore. Culvert locations depicting impoundment connectivity are also shown. The inset clarifies the study location relative to other state and natural boundaries.

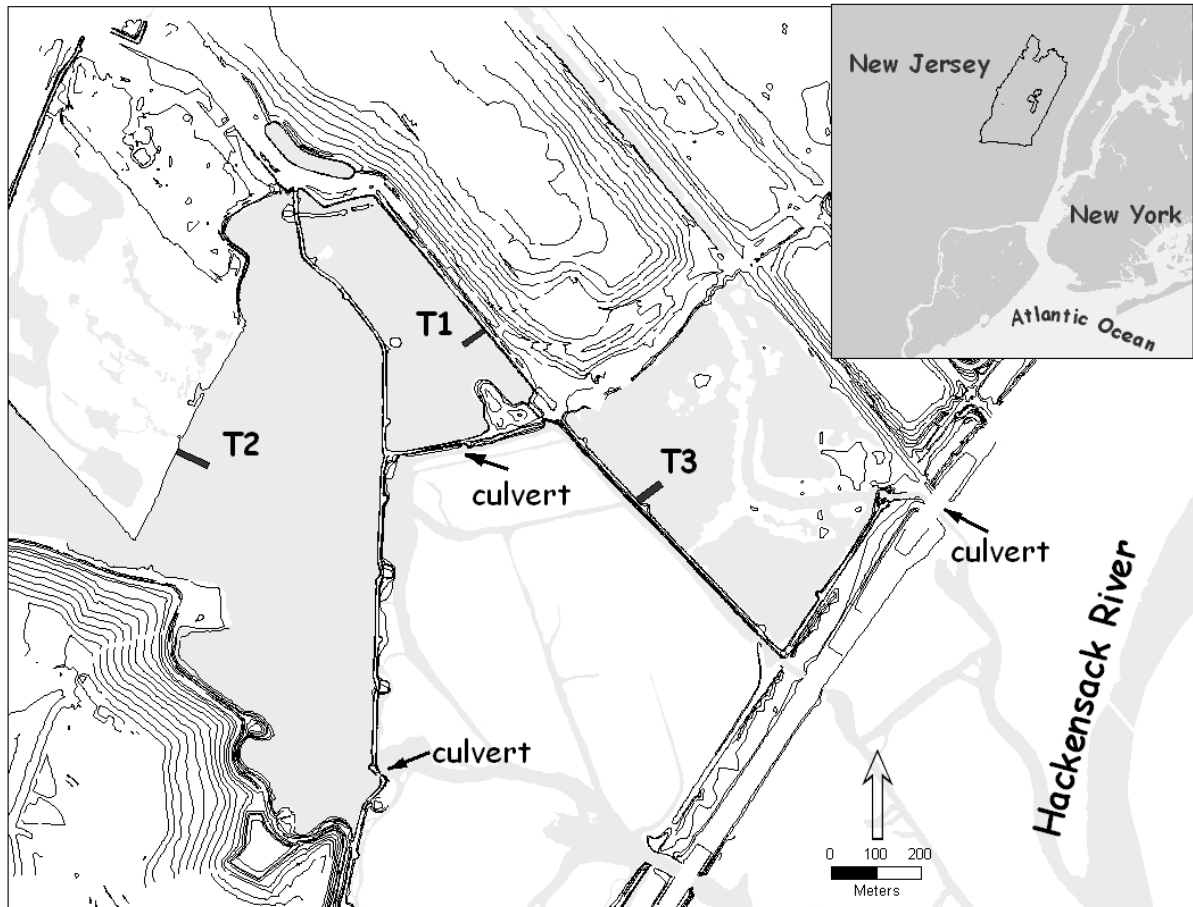


Figure 2. Chl a and TSS concentrations from the shore to the end of each transect (approximately 20 meters inshore). Concentrations of TSS were of the same order for all transects sampled. However, Chl a concentration in transect three was 10 folds less than the concentration in transects one, two. This difference allowed us to fine tune our images for Chl a concentrations below a certain threshold; in particular, pixels depicting Chl a concentrations less than 2. ug/ are reclassified using transect three data exclusively. The coefficients of determination (r^2) for Chl a were all > 0.7 while the coefficients of determination for TSS were < 0.4 .

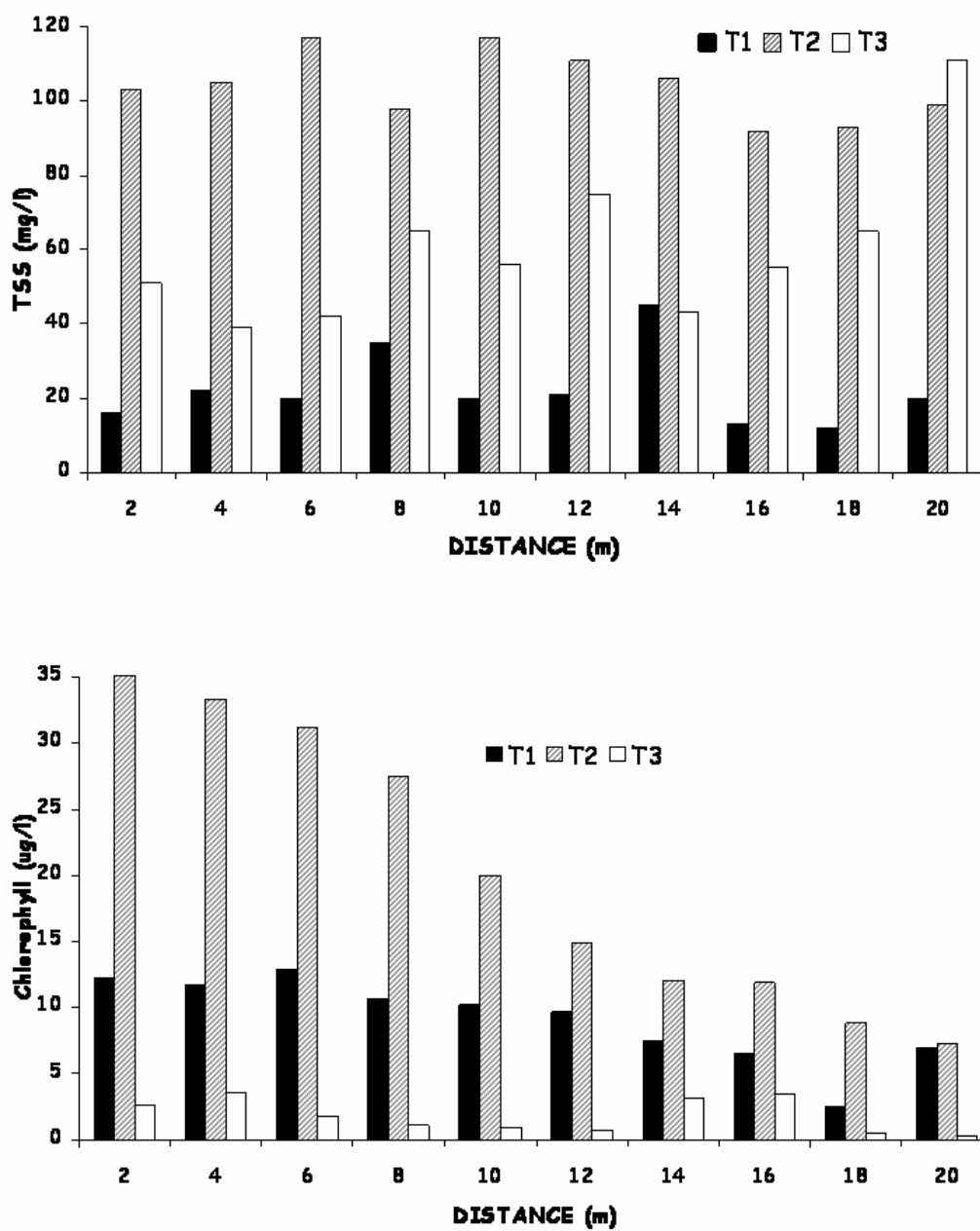


Figure 3. Results of the LaGrange interpolation polynomial [2]. The figure depicts a typical zero-order curve (raw reflectance) and the corresponding first and second derivatives. Note that the zero-order curves are smoothed prior to differentiation to reduce noise enhancement.

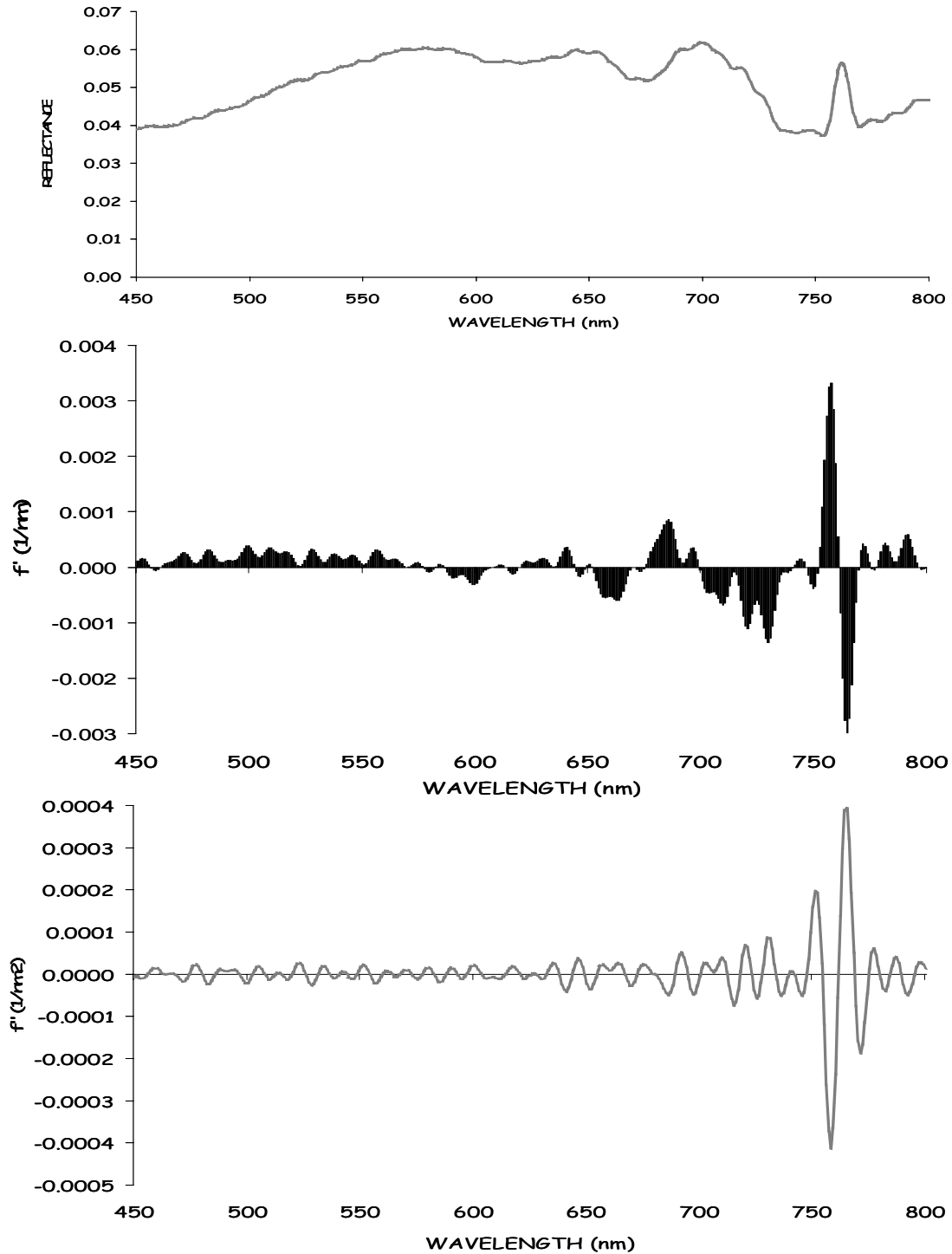


Table 1. The correlation coefficients between reflectance indices from the literature and Chl a for zero-, first-, and order derivatives of reflectance. Correlation coefficients with probabilities of $P < .05$ (statistically significant) are in bold. For T1, N=9, for T2, N=8, for T3, N=10 and for the overall model which includes all transects, N=27.

T1	Goodin R720		Goodin R660-R695		SzekielaR680/R670		Hladik	
	TSS	Chl	TSS	Chl	TSS	Chl	TSS	Chl
1st	-0.026	-0.840**	0.004	0.511*	-0.051	0.649**	-0.005	0.747**
	-0.026	-0.840**	0.010	0.558*	-0.055	0.652**	-0.007	0.762**
2nd	-0.026	-0.840**	0.021	0.857**	-0.070	0.632*	-0.004	-0.567*
T2								
	TSS	Chl	TSS	Chl	TSS	Chl	TSS	Chl
1st	0.126	-0.229	-0.248	-0.144	0.001	0.659*	0.071	0.824**
	0.126	-0.229	-0.254	-0.132	0.001	0.650*	0.073	0.822**
2nd	0.126	-0.229	-0.084	0.358	0.040	0.844**	0.212	0.353
T3								
	TSS	Chl	TSS	Chl	TSS	Chl	TSS	Chl
1st	-0.006	-0.100	0.156	0.000	-0.356	0.742**	-0.555**	0.741**
	-0.006	-0.100	0.157	0.000	-0.418*	0.762**	-0.554**	0.744**
2nd	-0.006	-0.100	0.016	0.076	-0.603**	0.771**	-0.128	0.004
N=27								
	TSS	Chl	TSS	Chl	TSS	Chl	TSS	Chl
1st	0.005	-0.122	-0.435**	-0.190*	0.204*	0.403**	0.407**	0.853**
	0.005	-0.122	-0.434**	-0.191*	0.113	0.372**	0.405**	0.855**
2nd	0.005	-0.122	0.000	0.146*	0.427**	0.784**	0.548**	0.658**

* Significant at $p < 0.05$ level (two tailed)

** Significant at $p < 0.01$ level (two tailed)