



Supplement of

Hyperspectral imaging sediment core scanning tracks high-resolution Holocene variations in (an)oxygenic phototrophic communities at Lake Cadagno, Swiss Alps

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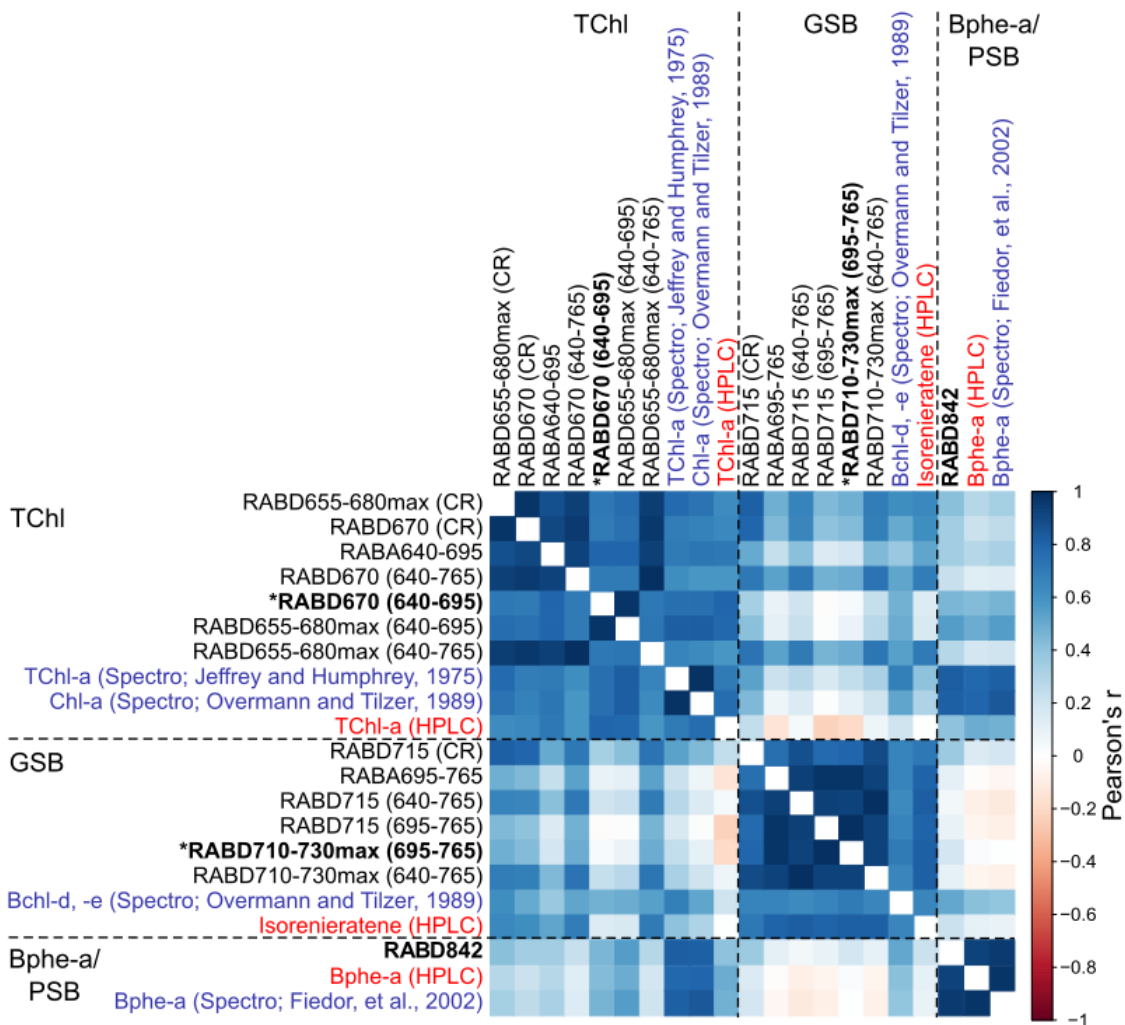


Figure S1: Correlation matrix comparing the similarity of various HSI index formulations and pigment measurements on extracted samples (n = 21). HSI indices are labeled in black text, spectrophotometer measurements with blue text, and HPLC measurements in red text. CR = continuum removal. RABA = relative absorption band area. Numbers given within parenthesis represent the wavelengths used as endpoints to define the absorption band trough. Correlation values used to make this figure are shown in Table S1.

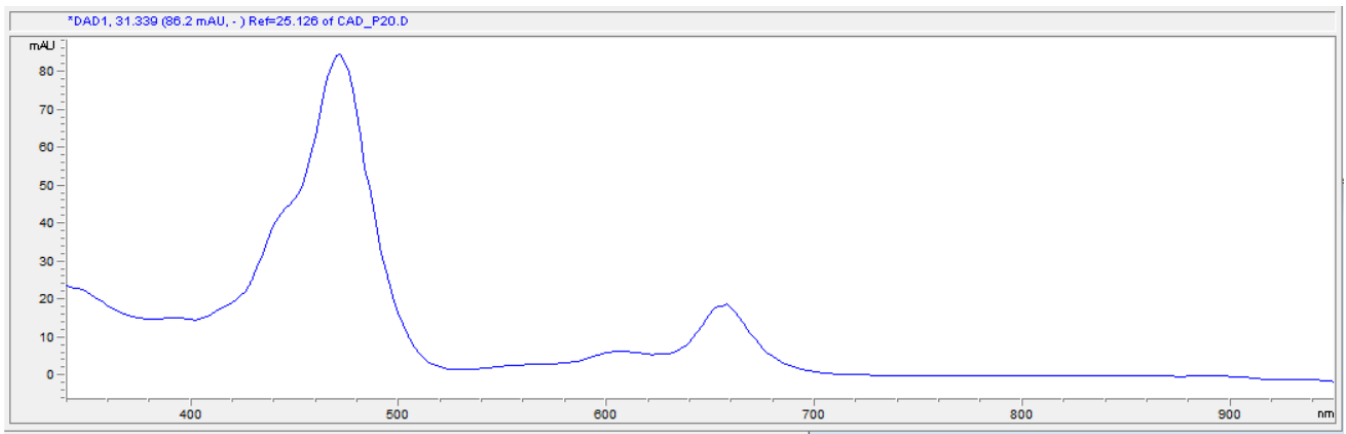
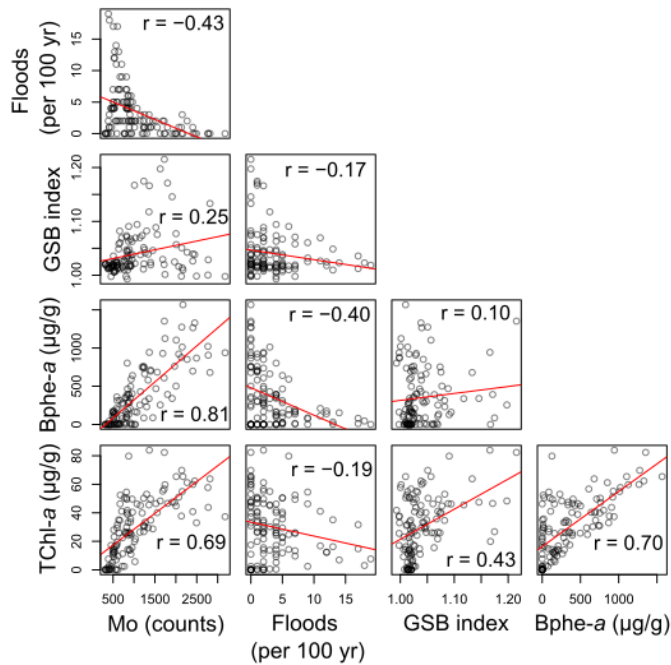
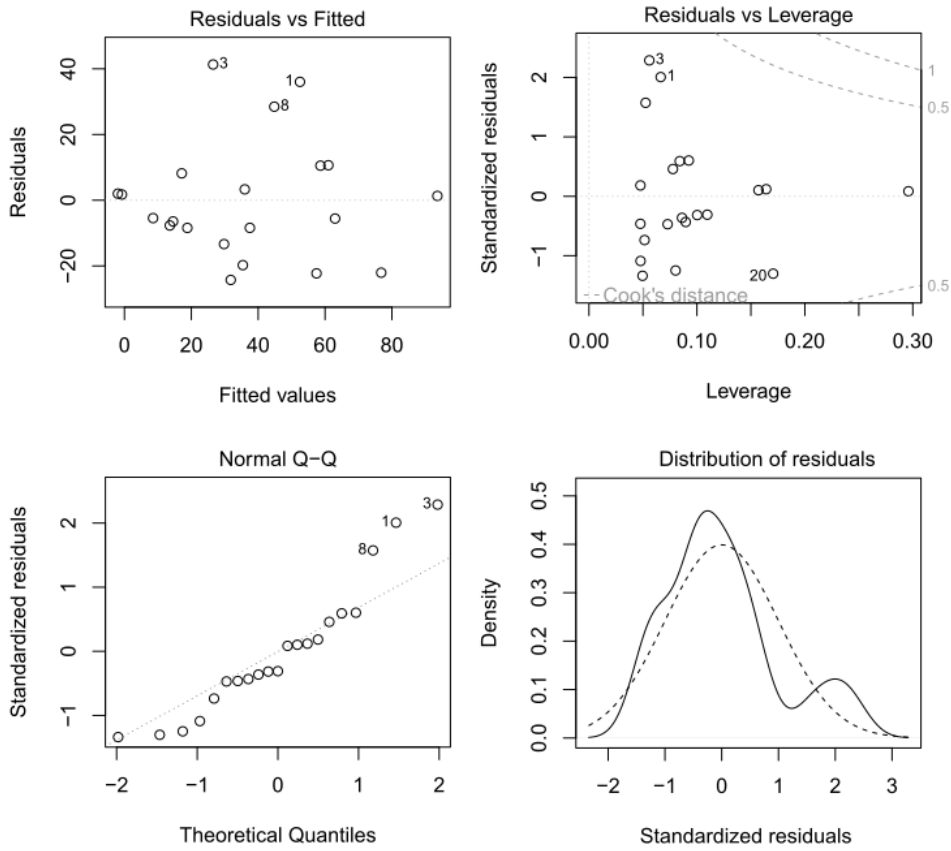


Figure S2: Absorbance spectra obtained from suspected Bphe-*e* (retention time = 31.4 min) in sample 20 (8.9 kyr BP).



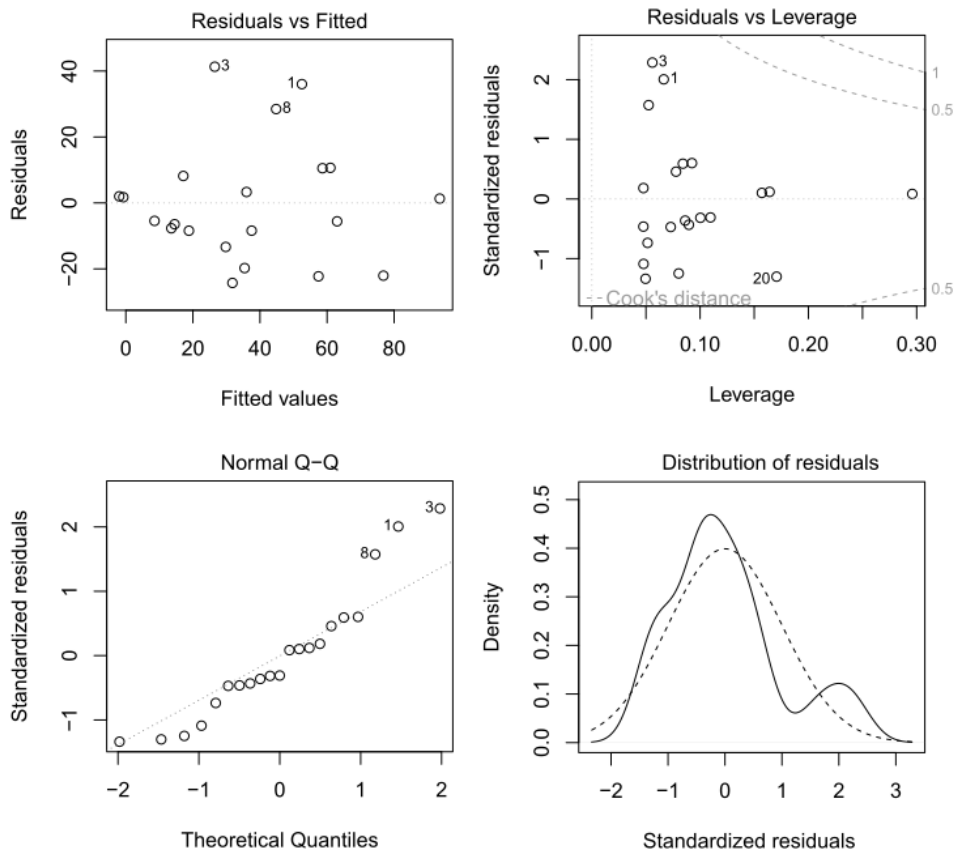
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Figure S3: Scatterplots of relationships between selected sedimentary variables at Lago Cadagno. Each data point represents the mean of a 100-year interval (n = 125).



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Figure S4: Diagnostic plots for the regression of RABD₈₄₂ and Bphe-*a*. A) Residuals plotted versus fitted values. B) Residuals plotted vs leverage. A 0.5 threshold for Cook's distance is shown as dashed gray lines; no data points exceed the threshold of 0.5. C) Q-Q plot of the residuals. D) Density plot of the residuals (solid line) compared to a normal distribution (dashed line).



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Figure S5: Diagnostic plots for the regression of RABD₆₇₀ and TChl. A) Residuals plotted versus fitted values. B) Residuals plotted vs leverage. Cook's distance is shown as dashed gray lines; no data points exceed the threshold of 0.5. C) Q-Q plot of the residuals. D) Density plot of the residuals (solid line) compared to a normal distribution (dashed line).

Table S1: Correlation matrix of hyperspectral indices and pigment measurements on extracted samples (n=21). Values shown are Pearson's r correlation coefficient; significant correlations (p < 0.05) are indicated in bold. P-values were calculated using a permutation test (Bishara and Hittner, 2012) with 10,000 permutations, and were corrected using the Benjamini-Hochberg procedure (Benjamini and Hochberg, 1995). The three HSI indices selected for downcore reconstruction are indicated by an asterisk. CR = continuum removal. RABA = relative absorption band area. Numbers given within parenthesis represent the wavelengths used as endpoints to define the absorption band trough.

	RABD670 (CR)	RABA640- 695	RABD670 (640-765)	*RABD670 (640-695)	RABD655- 680max (640-695)	RABD655- 680max (640-765)	TChl- <i>a</i> (Spectro; Jeffrey and Humphrey, 1975)	Chl- <i>a</i> (Spectro; Overmann and Tilzer, 1989)	TChl- <i>a</i> (HPLC)	RABD712 (CR)	RABA695- 765	RABD715 (640-765)	RABD715 (695-765)	*RABD710- 730max (695-765)	RABD710- 730max (640-765)	Bchl- <i>d,-e</i> (Spectro; Overmann and Tilzer, 1989)	Isorenieratene (HPLC)	*RABD842	Bphe- <i>a</i> (HPLC)	Bphe- <i>a</i> (Spectro; Fiedor et al., 2002)
RABD655-680max (CR)	0.979	0.876	0.930	0.720	0.768	0.948	0.774	0.738	0.627	0.815	0.481	0.665	0.446	0.485	0.699	0.618	0.646	0.420	0.289	0.336
RABD670 (CR)		0.907	0.954	0.704	0.741	0.965	0.697	0.677	0.642	0.798	0.450	0.655	0.404	0.433	0.686	0.508	0.618	0.345	0.214	0.256
RABA640-695			0.926	0.796	0.794	0.933	0.705	0.721	0.718	0.505	0.238	0.414	0.157	0.190	0.440	0.379	0.528	0.346	0.288	0.326
RABD670 (640-765)				0.707	0.705	0.995	0.619	0.583	0.588	0.718	0.538	0.714	0.475	0.491	0.732	0.528	0.697	0.224	0.130	0.145
*RABD670 (640-695)					0.980	0.710	0.755	0.753	0.815	0.332	0.097	0.205	-0.013	0.037	0.237	0.470	0.143	0.459	0.436	0.466
RABD655-680max (640-695)						0.727	0.824	0.825	0.798	0.419	0.117	0.229	0.020	0.086	0.271	0.500	0.166	0.558	0.498	0.552
RABD655-680max (640-765)							0.666	0.634	0.589	0.737	0.531	0.702	0.470	0.496	0.725	0.541	0.703	0.289	0.183	0.210
TChl- <i>a</i> (Spectro; Jeffrey and Humphrey, 1975)								0.981	0.711	0.531	0.215	0.275	0.164	0.246	0.324	0.681	0.410	0.824	0.784	0.819
Chl- <i>a</i> (Spectro; Overmann and Tilzer, 1989)									0.766	0.443	0.075	0.154	0.017	0.102	0.205	0.527	0.306	0.819	0.797	0.844
TChl- <i>a</i> (HPLC)										0.237	-0.143	0.047	-0.223	-0.191	0.081	0.227	0.013	0.398	0.498	0.473
RABD712 (CR)											0.760	0.875	0.774	0.797	0.900	0.661	0.715	0.360	0.157	0.184
RABA695-765												0.935	0.979	0.977	0.926	0.669	0.807	0.118	-0.016	-0.048
RABD715 (640-765)													0.937	0.927	0.998	0.637	0.821	0.054	-0.089	-0.117
RABD715 (695-765)														0.993	0.928	0.661	0.810	0.092	-0.054	-0.090
*RABD710-730max (695-765)															0.924	0.703	0.816	0.185	0.027	0.005
RABD710-730max (640-765)																0.653	0.819	0.100	-0.051	-0.070
Bchl- <i>d,-e</i> (Spectro; Overmann and Tilzer, 1989)																	0.658	0.513	0.419	0.396
Isorenieratene (HPLC)																		0.219	0.109	0.091
*RABD842																			0.926	0.959
Bphe- <i>a</i> (HPLC)																				0.972

References

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