

Support Information

Table S1. Mean values (\pm Standard deviation) of the physical-chemical parameters measured in the three lakes sampled.

	pH	Conductivity (μ S/cm)	Concentration O ₂ (mg/L)	Temperature (°C)	Salinity (‰)	Nitrite (mg/L)	Nitrate (mg/L)	Ammonia (mg/L)	Phosphate (mg/L)	Silicate (mg/L)
Lake 1	7.23 \pm 0.15	267 \pm 4.04	8.08 \pm 0.51	10.5 \pm 0.40	0.15 \pm 0.02	0.2 \pm 0.00	11.67 \pm 0.26	0.43 \pm 0.02	0.34 \pm 0.00	2.21 \pm 0.01
Lake 2	6.82 \pm 0.14	360 \pm 4.04	3.99 \pm 0.69	11.2 \pm 0.10	0.22 \pm 0.01	0.2 \pm 0.00	6.79 \pm 0.26	1.68 \pm 0.01	0.08 \pm 0.01	1.74 \pm 0.01
Lake 3	7.33 \pm 0.06	352 \pm 1.00	9.84 \pm 1.11	11.0 \pm 0.32	0.22 \pm 0.01	0.2 \pm 0.00	9.30 \pm 0.00	0.98 \pm 0.00	0.13 \pm 0.01	1.67 \pm 0.01

Table S2. Diatom valve counts and valve percentage found in the three lakes of Oporto's City Park. Species with the abundance superior to 1% in at least one lake are highlighted.

Species	Valve count				Valve percentage (%)			
	Lake 1	Lake 2	Lake 3	Total	Lake1	Lake 2	Lake 3	Total
<i>Achnantheidium exiguum</i> (Grunow) Czarnecki 1994	0	2	6	8	0.0	0.5	1.5	0.6
<i>Achnantheidium minutissimum</i> (Kützing) Czarnecki 1994	4	105	10	119	1.0	24.6	2.5	9.6
<i>Achnantheidium saprophilum</i> Kützing 1844	0	0	6	6	0.0	0.0	1.5	0.5
<i>Achnantheidium subhudsonis</i> (Hustedt) H.Kobayasi 2006	2	0	1	3	0.5	0.0	0.2	0.2
<i>Amphora minutissima</i> W.Smith 1853	0	0	2	2	0.0	0.0	0.5	0.2
<i>Amphora ovalis</i> (Kützing) Kützing 1844	0	4	0	4	0.0	0.9	0.0	0.3
<i>Amphora pediculus</i> (Kützing) Grunow 1875	6	8	96	110	1.5	1.9	23.5	8.9
<i>Amphora veneta</i> Kützing 1844	0	0	5	5	0.0	0.0	1.2	0.4
<i>Cocconeis placentula</i> var. <i>euglypta</i> (Ehrenberg) Grunow 1884	2	0	0	2	0.5	0.0	0.0	0.2
<i>Cocconeis placentula</i> var. <i>lineata</i> (Ehrenberg) Van Heurck 1885	0	2	0	2	0.0	0.5	0.0	0.2
<i>Ctenophora pulchella</i> (Ralfs ex Kützing) D.M.Williams & Round 1986	0	22	6	28	0.0	5.2	1.5	2.3
<i>Cyclotella meneghiniana</i> Kützing 1844	0	2	3	5	0.0	0.5	0.7	0.4

<i>Cyclotella stelligera</i> (Cleve & Grunow) Van Heurck 1882	0	0	27	27	0.0	0.0	6.6	2.2
<i>Cymbella tumida</i> (Brébisson) Van Heurck 1880	0	9	0	9	0.0	2.1	0.0	0.7
<i>Eolimna minima</i> (Grunow) Lange-Bertalot in Moser & al. 1998	4	0	21	25	1.0	0.0	5.1	2.0
<i>Fragilaria pararumpens</i> Lange-Bertalot, G.Hofmann & Werum, 2013	65	4	24	93	15.9	0.9	5.9	7.5
<i>Fragilaria parva</i> (Grunow) A.Tuji & D.M.Williams 2008	2	0	4	6	0.5	0.0	1.0	0.5
<i>Fragilaria vaucheriae</i> (Kützing) J.B.Petersen 1938	0	0	20	20	0.0	0.0	4.9	1.6
<i>Gomphonema acuminatum</i> Ehrenberg 1832	0	0	4	4	0.0	0.0	1.0	0.3
<i>Gomphonema affine</i> Kützing 1844	4	7	0	11	1.0	1.6	0.0	0.9
<i>Gomphonema clavatum</i> Ehrenberg 1832	2	0	2	4	0.5	0.0	0.5	0.3
<i>Gomphonema exilissimum</i> (Grunow) Lange-Bertalot & E.Reichardt 1996	9	0	0	9	2.2	0.0	0.0	0.7
<i>Gomphonema gracile</i> Ehrenberg 1838	0	0	2	2	0.0	0.0	0.5	0.2
<i>Gomphonema lagenula</i> Kützing 1844	31	0	0	31	7.6	0.0	0.0	2.5
<i>Gomphonema olivaceum</i> (Hornemann) Ehrenberg 1838	0	4	0	4	0.0	0.9	0.0	0.3
<i>Gomphonema parvulum</i> (Kützing) Kützing 1849	128	6	6	140	31.4	1.4	1.5	11.3
<i>Luticola goeppertiana</i> (Bleisch) D.G.Mann ex J.Rarick, S.Wu, S.S.Lee & Edlund 2017	0	4	0	4	0.0	0.9	0.0	0.3
<i>Mayamaea permitis</i> (Hustedt) K.Bruder & Medlin 2008	1	1	0	2	0.2	0.2	0.0	0.2
<i>Melosira varians</i> C.Agardh 1827	89	23	7	119	21.8	5.4	1.7	9.6
<i>Navicula cryptocephala</i> Kützing 1844	21	2	7	30	5.1	0.5	1.7	2.4
<i>Navicula cryptotenella</i> Lange-Bertalot 1985	5	1	0	6	1.2	0.2	0.0	0.5
<i>Navicula gregaria</i> Donkin 1861	12	6	24	42	2.9	1.4	5.9	3.4
<i>Navicula radiosa</i> Kützing 1844	0	0	2	2	0.0	0.0	0.5	0.2
<i>Navicula veneta</i> Kützing 1844	0	0	21	21	0.0	0.0	5.1	1.7
<i>Nitzschia amphibia</i> Grunow 1862	0	16	14	30	0.0	3.8	3.4	2.4
<i>Nitzschia capitellata</i> Hustedt, 1922	6	0	2	8	1.5	0.0	0.5	0.6
<i>Nitzschia communis</i> Rabenhorst 1860	0	4	0	4	0.0	0.9	0.0	0.3
<i>Nitzschia fonticola</i> (Grunow) Grunow 1881	0	13	0	13	0.0	3.1	0.0	1.0

<i>Nitzschia inconspicua</i> Grunow 1862	1	6	10	17	0.2	1.4	2.5	1.4
<i>Nitzschia palea</i> (Kützing) W.Smith 1856	14	29	8	51	3.4	6.8	2.0	4.1
<i>Pinnularia microstauron</i> (Ehrenberg) Cleve 1891	0	0	2	2	0.0	0.0	0.5	0.2
<i>Planothidium frequentissimum</i> (Lange-Bertalot) Lange-Bertalot 1999	0	1	12	13	0.0	0.2	2.9	1.0
<i>Pseudostaurosira brevistriata</i> (Grunow) D.M.Williams & Round 1988	0	4	12	16	0.0	0.9	2.9	1.3
<i>Tabularia tabulata</i> (C.Agardh) Snoeijs 1992	0	123	40	163	0.0	28.9	9.8	13.1
<i>Ulnaria ulna</i> (Nitzsch) Compère 2001	0	18	2	20	0.0	4.2	0.5	1.6
Total	408	426	408	1242	100.0	100.0	100.0	100.0

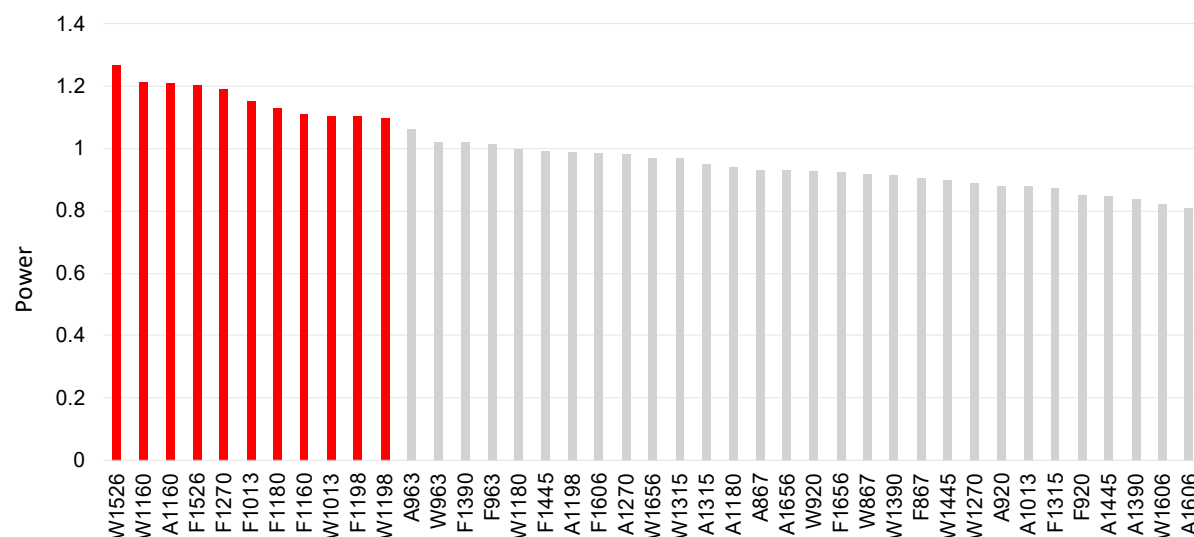


Figure S1. Graphical representation of the most important Raman variables in explaining the variance in the components according to PLS results. The most important variables are highlighted in red: Width (W) of the bands 1526, 1160, 1013 and 1198 cm^{-1} , Area (A) of the band 1160 cm^{-1} and Frequency (F) of the bands 1526, 1270, 1013, 1180, 1160 and 1198 cm^{-1} .