Paleolimnological analysis of Summit Lake, B.C -- Final Report (March 2000)

Contractor: Dr. Brian Cumming, Assistant Professor
Paleoecological Environmental Assessment and Research Laboratory
Dept. of Biology, Queen's University, Kingston, ON, K7L 3N6,
Ph.: (613) 533-6153; FAX: (613) 533-6617; e-mail: cummingb@biology.queensu.ca

Supplier: Queen's University, Contact person: Dr. Bruce Hutchinson, Office of Research Services, Ph.: (613) 533-6081; FAX: (613) 533-6853

List of Figures and Appendices:

BACKGROUND

Summit Lake was cored on October 4, 1999 by Rick Nordin and Bruce Carmichael. The core was retrieved using a modified K-B corer (internal diameter ~ 6.35 cm) from the deep basin. On shore the core was sectioned into 0.5-cm intervals into 120-ml plastic containers. Every other sample was shipped on ice to Queen's University where they were stored in our coldroom at 4°C. The containers were weighed to determine the total wet weight of sediment prior to subsampling for ^{210}Pb analyses. Twenty intervals (every 2 cm) were subsampled for diatom and sixteen intervals for ^{210}Pb analysis. Prepared samples for ^{210}Pb analysis (see below) were sent to MYCORE Ltd.

METHODS

210-Pb Dating and Percent Organic Matter

The wet weight of the sediment was determined for all the subsections of the core that were shipped to Queen's. Sixteen subsamples of wet sediment from each core were weighed and oven-dried (24 hr at 105°C) and reweighed to determine percent water and dry weight of the sediment. Samples that were submitted for ^{210}Pb analysis were ground to a fine dust by use of a pestle and redried overnight at 105°C. The weight of this dried sediment was recorded to four decimal places after it was put in a tared plastic digestion tube for determination of ^{210}Pb activity that was shipped to MYCORE Ltd.

Percent organic matter for each of the 16 ^{210}Pb samples was determined using standard loss-on-ignition methods (Dean, 1974). A known quantity of dried sediment (recorded to four decimal places) was heated to 550°C for 2 hours. The difference between the dry weight of the sediment and the weight of sediment remaining after ignition was used to estimate the percent of organic matter in each sediment sample.

^{210}Pb activities were estimated from determination of 209-Po and a tracer of known activity by alpha spectroscopy. Unsupported ^{210}Pb is calculated by subtracting supported ^{210}Pb (the baseline activity determined from bottom samples of the core) from the total activity at each level. The sediment chronology and sedimentation rates were calculated using the constant rate of supply (CRS) model (Appleby and Oldfield, 1978) from the estimates of ^{210}Pb activities and estimates of cumulative dry mass (Binford, 1990). See Appendix B for summaries of ^{210}Pb analyses by MYCORE (B-1), summary of ^{210}Pb calculations (B-1,2), and output from the CRS model (B-3).

Diatom Preparation and Enumeration

Slides for diatom analysis were prepared using standard techniques (Cumming, Wilson, Smol and Hall, 1995). Briefly, a small amount of wet sediment was suspended in a 50:50 (molar) mixture of sulfuric and nitric acid in a 20-ml glass vial for 24 hr. prior to being submersed at 70°C in a hot water bath for 5 hr. The remaining sediment material was settled for a period of 24 hr, at which time the acid above the sample was removed. The sample was rinsed with distilled water and allowed to settle once again for 24 hrs. The procedure was repeated approx. 10 times until the sample was acid free (litmus test). The samples were settled onto coverslips in a series of four 100% dilutions, which when dry, were mounted onto glass slides using a high-resolution mounting media called Naphrax®. For each sample, at least 400 diatom taxa were enumerated with a Leica DMRB microscope equipped with DIC optics at 1000X magnification (Numerical Aperature of objective = 1.3). These analyses were based on the references of Krammer and Lange-Bertalot (1986, 1988, 1991a,b), Patrick and Reimer (1966, 1975) and Cumming et al. (1995).

Cluster Analysis

A depth-constrained cluster analysis was run on the diatom assemblages in the core to provide an unbiased assessment of changes in diatom assemblages through time. A squared chord distance was used as the similarity coefficient between samples in the cluster analysis. Zones based on this clustering algorithm were placed on the diatom stratigraphy to represent zones of similar diatom assemblages (dashed line on Fig. 2).

Diatom-based Reconstructions of Total Phosphorus

Inferences of total phosphorus from the diatom assemblages in the core are based on a phosphorus model developed from 111 freshwater lakes from the 219 lakes sampled by Wilson, Cumming & Smol (1996). This model is based on estimates of the optima of taxa from weighted-averaging regression on non-transformed relative percentage data. The coefficient of determination (r^2) of this model is 0.66, and the jackknifed r^2 is 0.47. This model is superior to the earlier models developed by Reavie, Hall & Smol (1995) for several reasons including its better predictive ability and the larger number of samples which provide more analogs for downcore reconstructions.

The total phosphorus inferences (Fig. 1E) were critically assessed to determine: 1) if they tracked the main direction of variation in the diatom species assemblages (Fig. 1D); and 2) to assess if the assemblages encountered in the core are well represented in the modern-day samples (Fig. 1F). If the diatom-based phosphorus reconstruction matches the main direction of variation in the diatom assemblages downcore, then we can be fairly confident that the diatoms are tracking changes correlated to phosphorus. If the correlation between the main direction of variation and the diatom-inferred phosphorus values is weak or nonexistent, then other environmental variables (e.g. pH, conductivity, turbulence, etc), or interactions between environmental variables, are likely responsible for the observed changes in diatom assemblages (i.e. other environmental variables besides changes in phosphorus are responsible for the observed changes).

Determination of the Main Direction of Variation

The main direction of variation in the diatom assemblages downcore was determined from the first axis scores from a principal components analysis (PCA) ordination using non-transformed species abundance data. A PCA was chosen to represent the main direction of variation of the diatom assemblages in this core based on the small gradient length (< 1.5 sd units) obtained in an initial detrended correspondence analysis(DCA) ordination.

Analog Analysis of Diatom Assemblages

The reliability of the downcore total phosphorus inferences assumes that the diatom assemblages encountered downcore are well represented in our modern diatom assemblages. To determine if appropriate analogs existed for the core samples, we determined which samples in our present-day dataset of 111 lakes most resembled each of the downcore samples. This determination was based on a squared chord dissimilarity coefficient between all species found in each of the core samples. The best match between downcore and modern samples was compared with the distribution of best match between modern samples. Any downcore sample that was more dissimilar than 80% of the modern distribution were deemed to be a 'poor analog'. Similarly, any downcore sample that was more dissimilar than 95% of the modern distribution were deemed to have 'no analog' in our present-day dataset. If the downcore assemblages have good representation in modern samples, more confidence can be placed in the reconstruction. If modern analogs do not exist or are poor, then caution must be placed in reconstructions from these downcore samples.

RESULTS AND DISCUSSION

^{210}Pb Profile, Sedimentation Rates and Organic Matter

The ^{210}Pb profile from Summit Lake shows an exponential decay curve with depth only from ~10 cm in the core. The relatively constant ^{210}Pb activity between the top of the core and 10 cm in depth could result from a number of different processes including an increase in sedimentation rates which is assumed in the CRS model on which Fig. 1B is based. However, the relatively constant ^{210}Pb activities in the uppermost portion of the core could also result from sediment mixing. Given the relatively constant organic matter in the core in the uppermost 10cm in combination with subtle changes in diatom assemblages during this period, the possibility of sediment disturbance cannot be ruled out. The ^{210}Pb profile from 10 cm downward in the core follows the expect exponential decay. The results of the time/depth calculations can be found in Appendix B3.

Diatom Assemblage Changes and Analyses

Approximately 150 diatom taxa were encountered in the sediment core from Summit Lake (Appendix C-1). Changes in the diatom assemblages indicate that this lake has only undergone minor changes in species composition over the last 300 years. Cluster analysis suggests the changes in diatom assemblages through time can be divided into two zones (Fig. 2).

Prior to c. 1910 (Fig. 2, Zone B), the diatom assemblage is dominated by *Fragilaria* taxa with TP optima generally less than 15 μg/L. Since c. 1910, there have small increase in the abundance of the planktonic taxon, *Asterionella formosa* (Fig. 2). However, the abundance of this taxon has also been higher lower in the core (Fig. 2). In conclusion, the floristic variation in this core have been minor, as have the inferences of TP which have varied between ~12 and 14 μg/L (Fig. 1E).

PCA axis 1 scores (Fig. 1D) account for only 33.4% of the variation in diatom taxa in this core. The coefficient of determination between the PCA axis 1 scores (Fig. 1D) and the log TP inferences (Fig. 1E) is low and not significant ($r^2 = 0.08$). Thus, the inferred changes in TP are not related to the main direction of variation in the diatom assemblages. The lack of correlation is probably not due to the lack of appropriate analogs (Fig. 1F). The main change in the diatom assemblage that is related to the axis 1 scores of the PCA is the increase in *F. brevistriata* between 18 and 26 cm in depth. This change does not appear to be related to changes in the trophic status of this lake.

In summary, the floristic changes in diatom species composition in this core suggest that trophic status has varied between little over the past two hundred years. The diatom assemblages that existed two hundred years ago, are similar to the assemblages that exist today.

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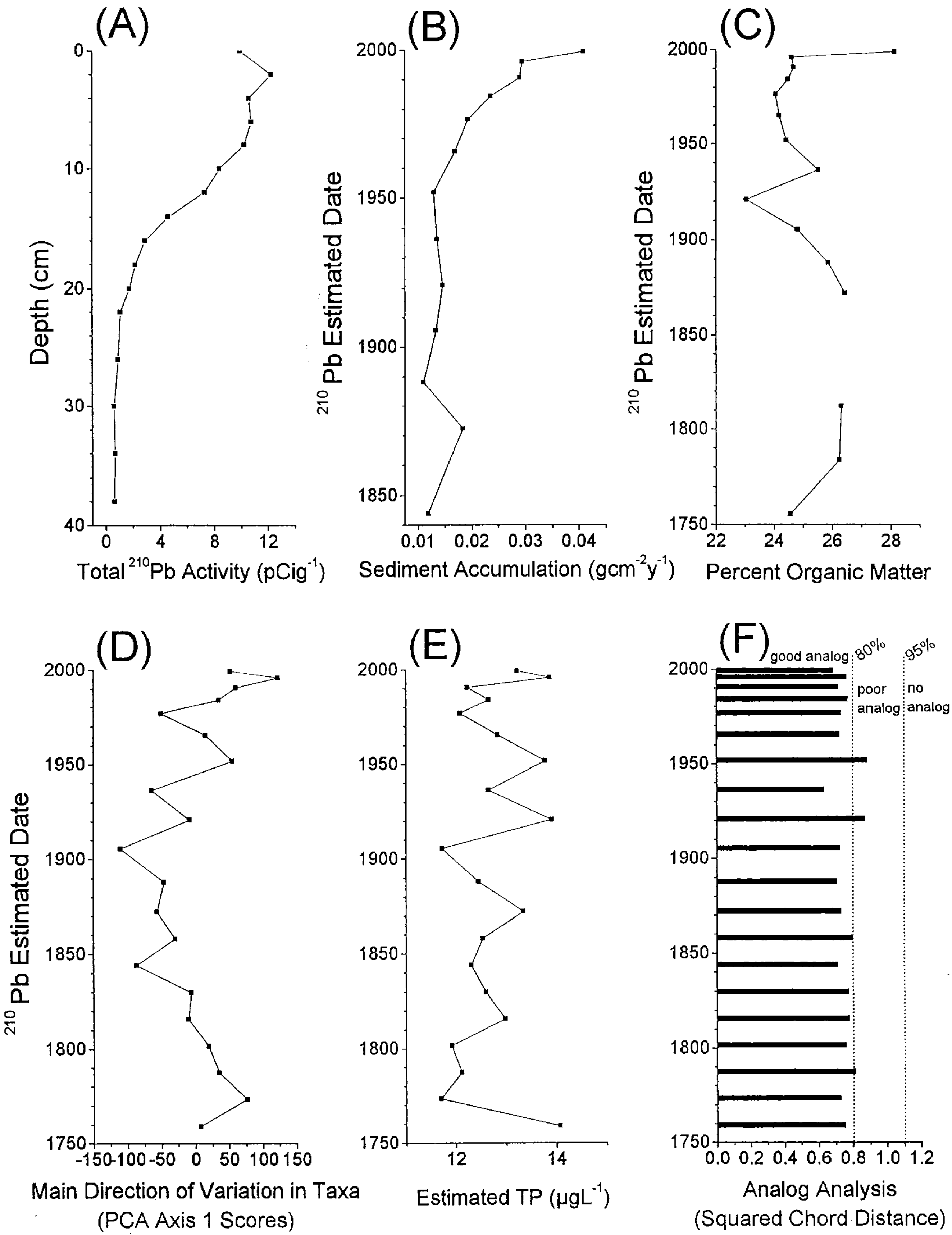
Figure Captions

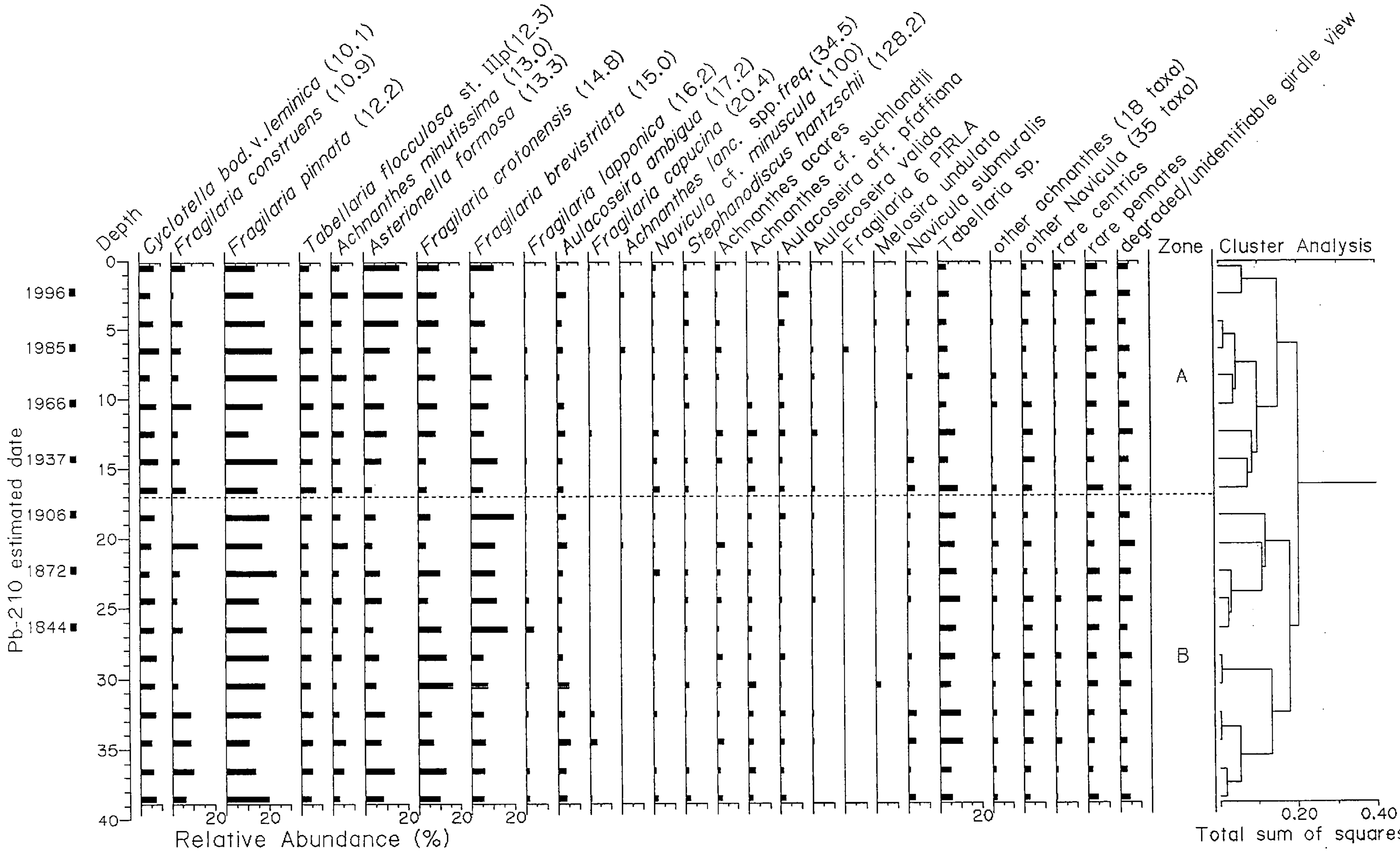
Figure 1. Summary diagram for the sediment core from Summit Lake showing: A) total ^{210}Pb activity from which the chronology of the core is based; B) the sediment accumulation rate; C) the change in the percent of organic matter in the core; D) the main direction of variation in the diatom assemblage data; E) diatom-based estimated late-summer total phosphorus; and F) analog analysis showing the dissimilarity between present-day and downcore samples (any sample that has a squared chord distance > 0.8 was determined to be a poor analog, whereas any sample with a squared chord distance greater than 1.1 was determined to have no analog in the modern dataset).

Figure 2. Stratigraphy of the dominant diatom taxa in the sediment core from Summit Lake, B.C. (see Appendix C for a complete list of taxa and the relative percentage data). The diatom taxa are arranged in order of increasing late-summer total phosphorus (TP) optima which are indicated in parentheses for those taxa with known optima. The dotted lines separate the stratigraphy into two zones that were identified by a cluster analysis on the diatom assemblage composition that was constrained to the depth of the core samples (see text for details).

Summit South Lake



Summit South Lake



Summit South Lake Summary File

Pb210 and LOI summary
(x-missing LOI values)

INTTOP (cm)	INTBOT (cm)	Pb210Act (pCi/g)	estimated AD date		LOI(550C %organic	SEDRATE (g/cm2/yr)
0	0.5	9.8939	1999.5		28.13	0.0407
2	2.5	12.1847	1996.1		24.61	0.0293
4	4.5	10.5588	1990.8		24.67	0.0289
6	6.5	10.7166	1984.6		24.48	0.0235
8	8.5	10.2110	1976.7		24.05	0.0193
10	10.5	8.3843	1965.7		24.17	0.0169
12	12.5	7.2849	1952.0		24.43	0.0129
14	14.5	4.5449	1936.6		25.52	0.0135
16	16.5	2.8589	1921.1		23.04	0.0146
18	18.5	2.1414	1905.7		24.81	0.0133
20	20.5	1.6895	1888.1		25.85	0.0109
22	22.5	1.0015	1872.4		26.42	0.0183
26	26.5	0.8624	1844.1	x		0.0118
30	30.5	0.5833	1812.3		26.30	
34	34.5	0.6317	1784.1		26.23	
38	38.5	0.6106	1755.8		24.56	

Diatom analyses

Depth (c TOP	Depth (c BOTTOM	estimated AD date	log TP	TP	PCA Axis 1	minumum sq. chord
0	0.5	1999.5	1.12	13.21	52	0.68
2	2.5	1996.1	1.14	13.87	123	0.76
4	4.5	1990.8	1.09	12.22	60	0.71
6	6.5	1984.6	1.10	12.65	35	0.77
8	8.5	1976.7	1.08	12.08	-51	0.73
10	10.5	1965.7	1.11	12.82	15	0.72
12	12.5	1952.0	1.14	13.77	55	0.88
14	14.5	1936.6	1.10	12.65	-65	0.63
16	16.5	1921.1	1.14	13.90	-9	0.87
18	18.5	1905.7	1.07	11.72	-111	0.72
20	20.5	1888.1	1.10	12.45	-47	0.71
22	22.5	1872.4	1.13	13.34	-57	0.73
24	24.5	1858.2	1.10	12.53	-31	0.80
26	26.5	1844.1	1.09	12.30	-87	0.71
28	28.5	1830.0	1.10	12.59	-7	0.77
30	30.5	1815.8	1.11	12.97	-11	0.78
32	32.5	1801.7	1.08	11.91	19	0.76
34	34.5	1787.6	1.08	12.11	35	0.81
36	36.5	1773.5	1.07	11.69	76	0.72
38	38.5	1759.3	1.15	14.06	7	0.75

Sample Number	Disk #	Section Top (cm)	of Core Bottom (cm)	Sample Weight used (mg)	209 Po Counts	210 Po Counts	210 Po Meas (Bq/g)	210 Po (Bq/g)	Precisn 1 STD (%)		Section Top (cm)	of Core Bottom (cm)	Back calculate to coring (KRL) Date Po Sample Extra (year)	(month)	(day)	Date of coring (year)	(month)	(day)	Time since coring (days)	Decay Corr. to Extractn (Bq/g)	Decay Corr. to Coring (Bg/g)	Std dev (Bg/g)
Summit L.										Summit S.												
33	551	0	0.5	541	9478	2660	0.319	0.364	2.2		0	0.5	99	12	10	99	10	4	67	0.364	0.3661	0.0052
34	552	2	2.5	501	8115	2579	0.393	0.448	2.3		2	2.5	99	12	10	99	10	4	67	0.448	0.4508	0.0063
35	553	4	4.5	607	3640	1206	0.341	0.388	3.3		4	4.5	99	12	10	99	10	4	67	0.388	0.3907	0.0088
36	554	6	6.5	678	4592	1737	0.346	0.394	2.8		6	6.5	99	12	10	99	10	4	67	0.394	0.3965	0.0078
37	555	8	8.5	638	2951	1008	0.330	0.376	3.6		8	8.5	99	12	10	99	10	4	67	0.376	0.3778	0.0095
38	556	10	10.5	767	5714	1917	0.269	0.308	2.6		10	10.5	99	12	10	99	10	4	67	0.308	0.3102	0.0062
39	557	12	12.5	641	5911	1440	0.234	0.268	2.9		12	12.5	99	12	10	99	10	4	67	0.268	0.2695	0.0057
40	558	14	14.5	519	4764	578	0.146	0.167	4.4		14	14.5	99	12	10	99	10	4	67	0.167	0.1682	0.0050
41	559	16	16.5	713	3920	411	0.092	0.105	5.2		16	16.5	99	12	10	99	10	4	67	0.105	0.1058	0.0044
42	560	18	18.5	639	3527	250	0.069	0.079	6.5		18	18.5	99	12	10	99	10	4	67	0.079	0.0792	0.0040
43	561	20	20.5	702	3021	183	0.054	0.062	7.6		20	20.5	99	12	10	99	10	4	67	0.062	0.0625	0.0039
44	562	22	22.5	737	4952	188	0.032	0.037	7.4		22	22.5	99	12	10	99	10	4	67	0.037	0.0371	0.0023
45	563	26	26.5	771	5545	187	0.028	0.032	7.4		26	26.5	99	12	10	99	10	4	67	0.032	0.0319	0.0020
46	564	30	30.5	685	5565	116	0.019	0.021	9.4		30	30.5	99	12	10	99	10	4	67	0.021	0.0216	0.0017
47	565	34	34.5	699	9118	205	0.020	0.023	7.1		34	34.5	99	12	10	99	10	4	67	0.023	0.0234	0.0014
48	566	38	38.5	798	4864	119	0.019	0.022	9.3		38	38.5	99	12	10	99	10	4	67	0.022	0.0226	0.0018

CALCULATIONS FOR INPUT INTO BINFORD PROGRAM

Summit South - Pb210

INTTOP (cm)	INTBOT (cm)	Back calculated to coring Pb-210 (Bq/g) activity	Std dev (Bg/g)	Pb210 activity (pCig-1)	Std dev (pCig-1)	Rho (g cm-3)
0	0.5	0.3661	0.0052	9.8939	0.1411	0.0469
2	2.5	0.4508	0.0063	12.1847	0.1698	0.0716
4	4.5	0.3907	0.0088	10.5588	0.2369	0.0843
6	6.5	0.3965	0.0078	10.7166	0.2117	0.0765
8	8.5	0.3778	0.0095	10.2110	0.2569	0.0925
10	10.5	0.3102	0.0062	8.3843	0.1677	0.1080
12	12.5	0.2695	0.0057	7.2849	0.1537	0.0953
14	14.5	0.1682	0.0050	4.5449	0.1362	0.1082
16	16.5	0.1058	0.0044	2.8589	0.1191	0.1079
18	18.5	0.0792	0.0040	2.1414	0.1083	0.1057
20	20.5	0.0625	0.0039	1.6895	0.1046	0.1071
22	22.5	0.0371	0.0023	1.0015	0.0627	0.1044
26	26.5	0.0319	0.0020	0.8624	0.0554	0.1080
30	30.5	0.0216	0.0017	0.5833	0.0448	0.1089
34	34.5	0.0234	0.0014	0.6317	0.0369	0.1073
38	38.5	0.0226	0.0018	0.6106	0.0500	0.1188
			avg	0.6085	=supported	
			stds	0.0242	0.6570	

BINFORD FILE INPUTS FOR CALCULATIONS OF DATES AND SEDIMENTATION RATES

Summit South
C1
16.00
0.0242

INTTOP (cm)	INTBOT (cm)	Pb210 Total (pCig-1)	Pb210 Unsup. (pCig-1)	Rho (g cm-3)	OM proportion	CUMTOP (g cm-2)	CUMBOT (g cm-2)	std Pb210 (pCig-1)
0.0000	0.5000	9.8939	9.2854	0.0469	0.281	0.0000	0.0235	0.1411
2.0000	2.5000	12.1847	11.5762	0.0716	0.246	0.1036	0.1394	0.1698
4.0000	4.5000	10.5588	9.9503	0.0843	0.247	0.2523	0.2944	0.2369
6.0000	6.5000	10.7166	10.1081	0.0765	0.245	0.4159	0.4542	0.2117
8.0000	8.5000	10.2110	9.6025	0.0925	0.241	0.5859	0.6322	0.2569
10.0000	10.5000	8.3843	7.7758	0.1080	0.242	0.7863	0.8403	0.1677
12.0000	12.5000	7.2849	6.6764	0.0953	0.244	1.0040	1.0516	0.1537
14.0000	14.5000	4.5449	3.9364	0.1082	0.255	1.1983	1.2524	0.1362
16.0000	16.5000	2.8589	2.2504	0.1079	0.230	1.4119	1.4659	0.1191
18.0000	18.5000	2.1414	1.5329	0.1057	0.248	1.6246	1.6774	0.1083
20.0000	20.5000	1.6895	1.0810	0.1071	0.259	1.8445	1.8980	0.1046
22.0000	22.5000	1.0015	0.3930	0.1044	0.264	2.0629	2.1151	0.0627
26.0000	26.5000	0.8624	0.2539	0.1080	0.264	2.4906	2.5446	0.0554
30.0000	30.5000	0.5833	0.0000	0.1089	0.263	2.9416	2.9961	0.0448
34.0000	34.5000	0.6317	0.0000	0.1073	0.262	3.4015	3.4551	0.0369
38.0000	38.5000	0.6106	0.0000	0.1188	0.246	3.9268	3.9862	0.0500

pb210

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C:\PB210>ECHO OFF
HIT CTRL-PRTSC, THEN RETURN FOR HARD COPY OUTPUT
HIT RETURN FOR SCREEN OUTPUT
Press any key to continue . . .
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YOU ARE ANALYZING CORE C1 FROM LAKE Summit South

THE DATA ARE:

INTTOP	INTBOT	PB210ACT	UNSUPACT	RHO	PERCORG	CUMMASST	CUMMASSB	SDACT
0.0	0.5	9.89390	9.28540	0.04690	0.280	0.0000	0.0235	0.1411
2.0	2.5	12.18470	11.57620	0.07160	0.240	0.1036	0.1394	0.1698
4.0	4.5	10.55880	9.95030	0.08430	0.240	0.2523	0.2944	0.2369
6.0	6.5	10.71660	10.10810	0.07650	0.240	0.4159	0.4542	0.2117
8.0	8.5	10.21100	9.60250	0.09250	0.240	0.5859	0.6322	0.2569
10.0	10.5	8.38430	7.77580	0.10800	0.240	0.7863	0.8403	0.1677
12.0	12.5	7.28490	6.67640	0.09530	0.240	1.0040	1.0516	0.1537
14.0	14.5	4.54490	3.93640	0.10820	0.250	1.1983	1.2524	0.1362
16.0	16.5	2.85890	2.25040	0.10790	0.230	1.4119	1.4659	0.1191
18.0	18.5	2.14140	1.53290	0.10570	0.240	1.6246	1.6774	0.1083
20.0	20.5	1.68950	1.08100	0.10710	0.250	1.8445	1.8980	0.1046
22.0	22.5	1.00150	0.39300	0.10440	0.260	2.0629	2.1151	0.0627
26.0	26.5	0.86240	0.25390	0.10800	0.260	2.4906	2.5446	0.0554
30.0	30.5	0.58330	0.00000	0.10890	0.260	2.9416	2.9961	0.0448
34.0	34.5	0.63170	0.00000	0.10730	0.260	3.4015	3.4551	0.0369
38.0	38.5	0.61060	0.00000	0.11880	0.240	3.9268	3.9862	0.0500

STANDARD DEVIATION OF SUPPORTED PB-210 = 0.0242

Pb-210 dates for Lake Summit South core C1

INTTOP	INTBOT	MIDINT	TTOP	SDTTOP	TBOT	SDTBOT	SEDRATE	SDSEDRT	SUMTOP
0.0	0.5	0.2	0.00	0.15	0.58	0.15	0.0407	0.0045	12.2400
2.0	2.5	2.2	3.12	0.15	4.35	0.16	0.0293	0.0038	11.1054
4.0	4.5	4.2	8.34	0.17	9.80	0.17	0.0289	0.0047	9.4403
6.0	6.5	6.2	14.42	0.18	16.05	0.18	0.0235	0.0040	7.8125
8.0	8.5	8.2	21.94	0.20	24.33	0.20	0.0193	0.0041	6.1817
10.0	10.5	10.2	32.55	0.23	35.74	0.24	0.0169	0.0035	4.4419
12.0	12.5	12.2	46.00	0.29	49.70	0.31	0.0129	0.0032	2.9220
14.0	14.5	14.2	61.24	0.41	65.24	0.44	0.0135	0.0041	1.8178
16.0	16.5	16.2	76.91	0.58	80.61	0.61	0.0146	0.0052	1.1161
18.0	18.5	18.2	92.11	0.81	96.09	0.87	0.0133	0.0058	0.6951
20.0	20.5	20.2	109.25	1.20	114.17	1.30	0.0109	0.0062	0.4077
22.0	22.5	22.2	126.04	1.75	128.89	1.85	0.0183	0.0103	0.2417
26.0	26.5	26.2	153.43	2.98	158.02	3.23	0.0118	0.0100	0.1030

Execution terminated : 0

C:\PB210>

Summit Lake South- Dec 99 Analyst: Joe Bennett

Diatom Relative Abundances (%)

Depth (cm) - samples in 0.5 cm intervals

taxa	code	0.5	2.5	4.5	6.5	8.5	10.5	12.5	14.5	16.5	18.5	20.5	22.5	24.5	26.5	28.5	30.5	32.5	34.5	36.5	38.5
Achnanthes acares	ac acar	2.14	1.15	1.67	2.73	1.55	0.68	3.18	2.65	0.69	0.65	3.79	1.71	2.47	0.97	2.52	1.87	1.12	2.90	1.38	2.36
Achnanthes aff. impexa	ac afim	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Achnanthes aff. subatomoides	ac afsu	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Achnanthes amoena	ac amoe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.86	0.95	0.00	0.41	0.00	1.38	0.00	0.00	0.48	0.69	0.47
Achnanthes clevi	ac clev	0.00	0.00	0.00	0.23	0.44	0.00	0.00	0.00	0.00	0.00	0.24	0.64	0.00	0.00	0.00	0.00	0.22	0.48	0.00	0.00
Achnanthes conspicua	AC CONS	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Achnanthes chilandos	ac chil	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
Achnanthes daonensis	ac daon	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.00	0.00	0.00	0.00
Achnanthes exigua	AC EXIG	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.43	0.71	0.00	0.62	0.48	0.46	0.00	0.45	0.24	0.46	0.95
Achnanthes aff. grana	ac gran	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00
Achnanthes impexa	ac impe	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.21	0.62	0.00	0.46	0.47	0.00	0.00	0.00	0.24
Achnanthes jouracense	ac jour	0.00	0.23	0.00	0.00	0.88	0.46	0.00	0.22	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.72	0.23	0.00
Achnanthes lacus-vulcani	ac lavu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Achnanthes lanceolata var. dubia	ac la.d	0.00	0.00	0.72	0.00	0.44	1.83	0.00	0.00	0.23	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Achnanthes lanceolata spp. frequentissima	AC LA F	0.00	1.38	0.00	2.05	0.22	0.00	0.00	0.00	0.00	0.43	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Achnanthes laterostrata	ac late	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Achnanthes minutissima	AC MINU	3.51	7.37	4.55	4.55	6.42	5.25	5.45	3.53	4.37	3.44	6.87	2.77	3.91	2.42	3.90	1.64	2.92	5.80	5.05	2.60
Achnanthes oblongella	ac oblo	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Achnanthes ricula	ac ricu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Achnanthes rosenstockii	AC ROSE	0.00	0.46	0.48	0.00	0.00	0.23	0.00	0.22	0.46	0.22	0.71	0.00	0.00	0.00	0.46	0.00	0.45	0.48	0.23	0.00
Achnanthes saccula	ac sacc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.00	0.00	0.00	0.00
Achnanthes cf. suchlandtii	ac afsc	0.00	0.00	0.00	0.00	0.44	2.05	4.09	1.77	3.22	1.72	2.13	1.07	1.44	1.69	1.15	3.28	1.80	1.93	2.75	1.65
Amphipleura pellucidea	ap pell	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Amphora libyca	AM LIBY	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	1.08	0.00	0.00	0.00	0.00	0.46	0.23	0.00	0.00	0.00	0.00
Amphora pediculus	AM PEDI	0.00	0.00	0.00	0.45	0.22	0.00	0.00	0.66	0.00	0.22	0.00	0.64	0.62	0.00	0.46	0.00	0.00	0.48	0.46	0.47
Asterionella formosa	AS FORM	16.18	17.97	16.03	11.82	5.31	8.68	10.00	7.28	3.22	5.16	3.08	6.61	7.61	3.86	6.19	5.15	8.54	7.25	13.53	7.80
Aulacoseira aff. pfaffiana	au afpf	0.78	4.61	2.39	0.45	1.77	2.05	2.50	1.32	1.84	2.37	0.71	0.43	0.62	0.48	1.83	0.23	2.02	1.45	1.38	1.89
Aulacoseira aff. purglaba	au afpu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aulacoseira alpigena	au alpi	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aulacoseira ambigua	AU AMBI	1.36	4.38	2.39	2.73	1.11	2.97	3.64	2.21	2.76	4.09	4.27	2.35	1.65	1.69	2.29	5.15	3.15	5.56	3.44	4.02
Aulacoseira crenulata	au cren	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aulacoseira livata	au liva	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.21	0.00	0.00
Aulacoseira subarctica	AU SUBA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aulacoseira sp. pl. 2	au sp.2	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aulacoseira valida	au valid	0.39	0.46	0.48	0.91	1.11	0.46	2.50	0.22	1.15	0.86	0.00	0.85	1.44	0.00	0.00	0.00	0.45	0.48	0.00	0.00
Brachysira vitrea	BR VITR	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.70	0.00	0.24	0.00	0.24
Caloneis undulata	ca undu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cocconeis neodiminuta	co neod	0.00	0.00	0.24	0.45	0.00	0.46	0.00	0.00	0.46	0.00	0.24	0.21	0.82	0.00	0.00	0.47	0.22	0.24	0.00	0.00
Cocconeis placentula	CO PLAC	0.00	0.00	0.00	0.00	0.00	0.46	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cocconeis placentula var. euglypta	CO PL.E	0.39	0.23	0.00	0.23	0.00	0.91	0.00	0.22	0.00	0.22	0.24	0.21	0.00	0.00	0.23	0.23	0.00	0.24	0.23	0.71
Cocconeis placentula var. lineata	CO PL.L	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47
Cyclotella bodanica var. lemanica	CY BO.L	6.63	5.30	6.22	9.32	4.65	7.53	6.59	8.39	8.05	6.67	4.98	4.48	7.00	6.28	7.57	6.79	7.19	5.07	5.96	7.33
Cyclotella pseudostelligera	cy pste	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	1.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cyclotella stelligera	CY STEL	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cymbella aff. delicatula	cm afde	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cymbella cymbiformis var. nonpunctata	CM CY.N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cymbella microcephala	CM MICR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.43	0.82	0.00	0.46	0.00	0.45	0.00	0.23	0.00
Cymbella minuta	CM MINU	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.22	0.00	0.22	0.00	0.43	0.41	0.48	0.00	0.00	0.00	0.00	0.23	0.00
Cymbella muelleri	CM MUEL	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cymbella naviculiformis	cm navi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cymbella silesiaca	CM SILE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diploneis marginstriata	di marg	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diploneis oblongella	di oblo	0.00	1.15	1.20	0.00	0.88	0.00	0.00	0.22	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00
Diploneis ovalis	di ova	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diploneis parma	di parm	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.41	0.48	0.00	0.00	0.22	0.00	0.00	0.00
Epithemia adnata	EP ADNA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.24
Epithemia sorex	ep sore	0.39	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eunotia spp.	eu spp.	0.00	0.00	0.00	0.23	0.22	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.23	0.47
Fragilaria 4 PIRLA	fr 4pir	0.19	0.23	0.00	0.45	0.22	0.46	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fragilaria 6 PIRLA	fr 6pir	0.00	0.00	0.00	2.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fragilaria brevistriata	FR BREV	10.72	1.38	6.46	2.73	9.29	7.76	5.68	11.92	5.29	19.57	10.90	10.66	11.52	16.43	5.50	7.49	5.39	6.28	5.73	5.20
Fragilaria capucina	FR CAPU	0.58	0.00	0.00	0.45	0.00	0.00	1.14	0.22	0.23	0.00	0.24	0.00	0.00	0.24	0.23	0.00	2.02	3.14	0.00	0.47
Fragilaria capucina var. gracilis	FR CA.G	1.36	0.00	0.00	0.00	0.00	0.23	0.45	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fragilaria capucina var. rumpens	fr ca.r	0.97	0.23	0.00	0.00	0.00	0.00	0.68	0.66	0.00	0.00	0.00	0.21	1.44	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Fragilaria construens	FR CONS	6.43	0.92	5.26	4.55	3.10	8.90	2.50	3.75	6.67	0.43	12.09	3.41	2.47	4.83	0.46	2.81	8.76	8.70	9.86	5.91
Fragilaria crotonensis	FR CROT	10.14	8.76	9.81	6.14	7.96	8.90	8.18	3.31	3.91	5.59	3.32	10.02	4.12	10.63	13.30	15.93	6.07	7.00	12.61	9.93
Fragilaria cyclopum	FR CYCL	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.24	0.00	0.00	0.00	0.23	0.00	0.67	0.00	0.00	0.00
Fragilaria lapponica	FR LAPP	0.00	0.23	0.00	0.91	1.11	0.00	0.00	0.44	0.46	0.22	0.00	0.21	1.44	3.62	0.00	1.17	0.67	0.00	1.38	1.18
Fragilaria nanana	FR NANA	0.00	0.00	0.00	0.45	0.22	0.68	0.91	0.00	0.46	0.43	0.00	0.00	0.00	0.00	0.00	0.47	0.00	0.24	0.00	0.00
Fragilaria pinnata	FR PINN	13.84	13.13	18.18	21.59	23.89	17.12	10.45	23.84	14.48	20.22	16.82	23.45	15.02	18.84	19.72	18.03	15.96	10.39	13.30	19.62
Fragilaria tenera	FR TENE	0.00	1.15	0.00	0.45	0.44	0.00	0.00	0.00	0.00	0.00	0.47	0.00	0.21	1.21	0.00	0.47	0.00	0.24	0.00	0.00
Fragilaria ulna	FR ULNA	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Frustulia rhomboides	fu rhom	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gomphonema acuminatum	GO ACUM	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gomphonema angustum	GO ANGU	0.00	0.23	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.00	0.00	0.62	0.00	0.00	0.00	0.22	0.24	0.00	0.24
Gomphonema cf. aquaemineralis	GO AQUA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gomphonema cf. olivaceum	go oliv	0.00	0.00	0.72	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.41	1.45	1.15	0.47	0.00	0.00	0.46	0.00
Gyrosigma acuminatum	gy acum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00
Melosira nummuloides	me numm	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Melosira undulata	me undu	0.00	0.46	0.48	0.23	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.11	0.00	0.00	0.00	0.00
Meridion circulare	mr circ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.00
Navicula aff. decussis	na afde	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.38	0.00	0.00	0.00	0.21	0.48	0.00	0.00	0.00	0.00	0.00	0.00
Navicula aff. impexa	na afim	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula aff. schmassmannii	na afsc	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula agrestis	na agre	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula arvenis	na arve	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula aurora	na auro	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula bacillum	na baci	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula capitata var. capitata	NA CA.C	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00
Navicula capitata var. hungarica	NA CA.H	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00
Navicula cocconeiformis	na cocc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.23	0.00
Navicula cryptocephala	NA CCEP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.94	0.00	0.00	0.00	0.00
Navicula cryptonella	NA CRYP	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.23	0.00
Navicula diluviana	na diluv	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula explanta	na expl	0.19	0.00	0.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula goppertiana	na gopp	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula jaernefeltii	na jear	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula laevissima	NA LAEV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.00
Navicula laterostrata	na late	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula minima	NA MINI	0.00	0.00	1.67	0.00	0.00	1.14	0.00	0.66	0.69	0.00	1.42	0.00	1.85	0.48	0.46	0.23	1.80	0.00	0.00	0.00
Navicula cf. minuscula	NA MINU	1.56	1.15	0.48	0.68	0.88	0.00	2.50	1.55	2.99	0.86	0.71	2.77	0.41	0.00	0.69	0.47	1.12	0.00	0.92	1.65
Navicula oblonga	NA OBLO	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00
Navicula porifera	na pori	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula pseudoscutiformis	na pscu	0.19	0.46	0.00	0.68	0.00	0.00	0.00	0.00	1.61	0.65	1.18	0.21	0.21	0.00	0.00	0.23	0.22	0.24	0.23	0.71
Navicula pseudoventralis	NA PSVE	0.00	0.23	0.00	0.00	0.00	0.00	0.45	0.88	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.45	0.72	0.00	0.24
Navicula pupula	NA PUPU	0.00	0.23	0.00	0.45	0.00	0.00	0.68	0.22	0.00	0.00	0.24	0.00	0.21	0.24	0.00	0.00	0.00	0.97	1.15	0.47
Navicula radiosa	NA RADI	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.22	0.00	0.43	0.00	0.21	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00
Navicula schaderi	na scha	0.00	0.69	0.00	0.00	0.00	0.23	1.14	0.00	0.00	0.00	0.47	0.64	1.03	0.00	0.46	0.00	0.00	0.00	0.00	0.00
Navicula scutelloides	na scte	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula seminulum	na semi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00
Navicula sp. 26 to 26.5	na 26.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.21	1.15	1.87	1.57	0.24	0.46	0.47
Navicula sp. 1PISCES	NA SP.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Navicula sp. pl. 20	na pl20	0.00	0.69	0.00	0.00	0.44	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula sp. pl. 23	na pl23	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00
Navicula submuralis	na sbmu	0.00	1.84	1.20	0.68	2.43	0.00	0.23	2.87	3.22	1.29	0.95	1.07	1.23	0.00	1.61	0.23	3.82	3.38	0.69	2.84
Navicula subminuscula	NA SUBM	0.78	0.92	0.00	0.00	0.22	0.91	1.36	0.88	0.00	0.00	0.00	0.00	0.21	0.97	1.15	0.00	0.00	0.72	0.00	0.47
Navicula vitabunda	NA VITA	0.58	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.23	0.86	0.00	0.00	0.21	0.00	0.92	0.23	0.00	0.00	0.00	0.00
Nitzschia amphibia	NI AMPH	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitzschia bacillum	NI BACI	0.00	0.23	0.48	0.00	0.22	0.00	0.00	0.00	1.15	0.43	0.00	0.64	0.00	0.48	0.00	0.47	0.00	0.00	0.23	0.00
Nitzschia dissipata var. media	ni dsvm	0.00	0.23	0.00	0.00	0.88	0.46	0.00	0.00	0.00	0.00	0.00	0.43	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.24
Nitzschia frustulum	NI FRUS	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitzschia gracilis	NI GRAC	0.39	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.48	0.46	0.00	0.00	0.00	0.00	0.00
Nitzschia liebetruthii fo. 1 PISCES	NI LI.1	0.19	0.23	0.48	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.49	0.00	0.24	0.46	0.00	0.00	0.48	0.00	0.95
Nitzschia liebetruthii fo. 2 PISCES	NI LI.2	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.71
Nitzschia palea	NI PALE	0.00	0.00	0.48	0.00	0.00	0.46	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitzschia perminuta	NI PERM	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	1.38	0.00	0.00	0.00	0.21	0.00	0.00	0.47	0.67	0.00	0.00	0.00
Nitzschia recicula	NI RADI	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitzschia valedstriata	ni vale	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.00	0.00	0.00	0.00
Pinnularia intermedia	pi intr	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pinnularia microstauron	PI MICR	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pinnularia subcapitata	pi subc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00
Stauroneis agrestis	sr agre	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00
Stephanodiscus hantzschii	ST HANT	1.36	2.30	2.15	1.82	1.55	2.28	0.45	1.32	1.61	0.43	0.47	1.28	1.23	0.97	0.23	1.64	0.45	0.00	1.38	2.13
Stephanodiscus hantzschii fo. 1PISCES	ST HA.1	0.19	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.46	0.23	0.22	0.72	0.00	0.00
Stephanodiscus minutulus	ST MINU	0.00	0.00	0.00	0.00	0.22	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stephanodiscus niagarae	ST NIAG	0.19	0.00	0.48	0.23	0.22	0.00	0.00	0.00	0.23	0.43	0.00	0.43	0.41	0.48	1.38	0.23	0.45	0.24	0.46	0.00
Stephanodiscus parvus	ST PARV	1.56	0.92	0.00	0.45	0.66	0.00	0.23	0.00	0.00	0.43	0.00	0.00	0.21	0.48	0.69	1.41	0.00	0.24	0.23	0.24
Tabellaria flocculosa trs. IIIp	TA FL3P	4.48	5.99	6.22	6.14	8.41	5.94	8.64	5.52	7.13	5.16	3.55	3.41	4.94	5.07	4.82	4.45	5.62	5.07	5.05	4.49
Tabellaria "dogboneia" (inverted ends)	ta dogb	3.90	5.07	3.59	4.32	5.09	3.20	7.50	4.19	8.74	7.74	7.11	8.10	9.47	7.73	7.11	4.92	9.66	10.39	5.05	5.44
degraded/unidentifiable girdle view	deg/grd	4.68	5.53	3.59	5.00	3.54	4.57	6.59	4.19	5.75	4.95	7.11	5.12	6.17	3.38	5.50	5.15	3.15	3.14	3.21	4.26