ECRC

Environmental Change Research Centre

Research Report No. 142

Diatom analysis of three Norwegian cores

Report to the Norwegian Institute for Water Research
Project Number O-28428

H. Bennion, G. Clarke, B. Goldsmith & R.W. Battarbee

February 2010

ISSN: 1366-7300

Environmental Change Research Centre
Department of Geography
University College London
Pearson Building, Gower Street
London, WC1E 6BT

LIST OF FIGURES

LIST OF TABLES

APPENDICES

ACKNOWLEDGEMENTS

The authors would like to thank Kevin Roe for preparing the slides and Sigrid Haande, the project manager at NIVA, for provision of site information.

1 INTRODUCTION AND OBJECTIVES

The purpose of this project is to supply diatom data to the Norwegian Institute of Water Research for cores from three Norwegian lakes: Steinsfjorden, Lyseren and Gjersjøen. The data will feed into a palaeolimnological project which also includes analysis of algal pigments and radiometric dating of the cores.

The study aims to assess shifts in the diatom assemblages and to determine the nature of the baseline assemblages. Additionally the project aims to apply an existing diatom-phosphorus (P) transfer function to the diatom data in order to infer the trophic histories of the lakes.

2 METHODS

2.1 Core collection

Three sites were selected for study and their main characteristics are summarised in Table 1. A sediment core, approximately 30-45 cm long, was collected in 2009 from each lake using a gravity coring device (Table 2). The cores were extruded at 1 cm intervals.

Table 1 Details of the study sites

Lake name	Latitude (N)	Longitude (E)	Lake area km^2	Lake altitude m asl	Lake mean depth m	Lake max depth m	Water retention time years	TP µg L^{-1}	TN µg L^{-1}	Chl-a µg L^{-1}
Steinsfjorden	60° 05' 33,98"	10° 19' 33,70"	7.5	63	10.2	24	4.6	9.3	262	5.3
Gjersjøen	59° 47' 16,31"	10° 46' 51,74"	2.7	40	23	64	3	14.2	1625	3.9
Lyseren	59° 41' 14,16"	11° 06' 23,15"	7.5	162	9	59	5.3	10.6	390	7.6

(chemistry data are mean values of several samples collected in summer 2008)

Table 2 Details of the cores

Lake name	Date of sampling	Water depth at coring site (m)	Core length (cm)
Steinsfjorden	17/03/2009	19	40
Gjersjøen	15/10/2009	17	45
Lyseren	09/11/2009	25	30

2.2 Diatom analysis

Diatom slides were prepared from 25 sub-samples of each core using standard techniques (Battarbee *et al.*, 2001). These were screened for preservation and to assess points of change in the core, following which 20 samples were selected for counting. Analysis was carried out using a Leitz research microscope with a 100x oil immersion objective and phase contrast. Principal floras used in identification were Krammer & Lange-Bertalot (1986-1991). A minimum of 300 valves were identified in each sample. All diatom data are expressed as percentage relative abundance.

A diatom-total phosphorus (TP) transfer function was applied to the diatom data for each core, following taxonomic harmonisation between the training set and the fossil data. Reconstructions of diatom-inferred TP (DI-TP) were produced using a training set of 56 relatively large, deep lakes (> 10 m maximum depth) from Scotland, Northern Ireland, Cumbria, southern Norway and central Europe. The training set has annual mean TP concentrations ranging from 1-73 µg TP L^{-1} and a median value of 22 µg TP L^{-1} (Bennion *et al.*, 2004). The best model was generated with simple weighted averaging and inverse deshrinking (ter Braak & van Dam, 1989). The coefficient of

determination (r^2) between observed and inferred values was 0.75 and the root mean squared error of prediction (RMSEP based on the jack-knifing cross validation method) was 0.25 $\log_{10}$ µg TP L^{-1}. All reconstructions were implemented using C^2 (Juggins, 2003).

2.3 Data analysis

Summary statistics of the diatom data were calculated for each sample in the cores including the number of taxa observed and the Hill's N2 diversity score (Hill & Gauch, 1980). The results of the analyses were plotted as stratigraphic diagrams using C2 (Juggins, 2003). Cluster analysis was performed on the core data to identify the major zones in the diatom records using CONISS (Grimm, 1987), implemented by TGView version 2.0.2 (Grimm, 2004) or ZONE v.1.2 (Juggins, 1991). CONISS is a program for stratigraphically constrained cluster analysis by the method of incremental sum of squares and ZONE is an MS-DOS program which employs a variety of constrained clustering techniques (ConsLink, ConISS, SplitLSQ and SplitINF) from which common splits can be identified. Zones are illustrated on the stratigraphic plots in order to facilitate description of the major compositional changes.

The degree of floristic change in the diatom assemblages between the bottom sample and every other sample in each core was assessed using the squared chord distance (SCD) dissimilarity coefficient (Overpeck *et al*., 1985) implemented in C2 (Juggins, 2003). This is preferred to other dissimilarity measures as it maximises the signal to noise ratio, it performs well with percentage data and has sound mathematical properties (Overpeck *et al*., 1985). The scores range from 0 to 2 whereby 0 indicates that two samples are exactly the same and 2 that they are completely different. Scores less than 0.29, 0.39, 0.48 and 0.58 indicate insignificant change at the 1st, 2.5th, 5th and 10th percentile, respectively (Simpson, 2005; Simpson *et al*., 2005).

Principal components analysis (PCA), an indirect ordination technique (ter Braak & Prentice, 1988), was used to analyse the variance downcore within the diatom assemblages using C2 (Juggins, 2003). The technique summarises the main changes in the data and helps to identify zones of change within complex species-rich data sets. The sample scores for PCA axis 1 are given. Where scores between two neighbouring samples in the core differ markedly this indicates that the assemblages have undergone substantial change between these two points in the core. The scores are also plotted in the stratigraphic diagrams to illustrate the timing of any shifts and whether these were gradual or abrupt.

3 STEINSFJORDEN

3.1 Diatom analysis

Twenty samples were analysed for diatoms in the Steinsfjorden core (Table 3). A total of 185 diatom taxa were observed in the core with between ~32 and 64 taxa per sample. The samples were not particularly diverse, N2 values being < 10 for all except the 8 cm sample. The results for the major taxa are shown in Figure 1 and the full dataset is presented in Appendix 1. Most of the abundant taxa were represented in the diatom-TP training set with over 80% of the assemblage being represented in all samples, except for the section 6-12 cm where representation ranged from 68-79%. This was largely due to the absence of *Cyclotella ocellata*, *Navicula submuralis* and *Navicula jaernfeltii* in the training set.

There were marked changes in the assemblages during the period represented by the core with three zones identified by cluster analysis. The chronology produced by DHI (2009a) was used to assign dates to the upper 8 cm of the core.

Zone 1 (38-11 cm)
Zone 1 was dominated by *Cyclotella* aff. *comensis* reaching a maximum abundance of 46% at 16 cm depth. This is a planktonic diatom typically associated with oligotrophic, deep waters. Several other planktonic *Cyclotella* species were also present (e.g. *C. radiosa*, *C. distinguenda* var. *unipunctata, C. kuetzingiana* var *planetophora*) along with *Aulacoseira ambigua*, and the planktonic taxa comprised ~50% of the total assemblage. The remainder of the assemblage was made up of a diverse non-planktonic flora including *Achnanthidium minutissimum, Staurosirella pinnata, Pseudostaurosira brevistriata, Fragilariforma exigua* and *Navicula submuralis.* The assemblage was relatively stable with only minor fluctuations in the relative percentage abundances. This stability is reflected in the PCA axis 1 scores which show only minor changes within this zone. The dissimilarity scores between the bottom sample and the other samples in Zone 1 were relatively low (SCD < 0.5) indicating low floristic change. The DI-TP reconstruction suggests that TP concentrations were relatively stable in Zone 1 at ~10 µg L^{-1}, thereby indicating nutrient-poor conditions.

Zone 2 (11-5 cm)
Cyclotella aff. *comensis* was the most abundant taxon in Zone 2 but was less dominant than in Zone 1, reaching 23% maximum abundance at 10 cm. Decreases in other nutrient-poor, planktonic *Cyclotella* species occurred, including *C. comensis, C. distinguenda* var. *unipunctata* and *C. kuetzingiana* var. *radiosa / C.rossii.* Conversely a relative rise was observed in *C. radiosa, Cyclotella ocellata* and *A. ambigua,* planktonic taxa typical of more productive conditions. A diverse non-planktonic flora was still present and overall diversity was higher in this zone than in Zones 1 and 3 owing to the greater evenness of the assemblage (Table 2). The PCA axis 1 scores increased at the Zone 1 / 2 boundary reflecting these compositional changes. Likewise the SCD scores increased to values of ~0.95 indicating deviation from the community at the core bottom. There was evidence of diatom dissolution within the upper section of this zone from 10 cm upwards, particularly in *A. ambigua* and *C. radiosa* valves. The DI-TP reconstruction suggests that TP concentrations exhibited their first notable increase at the Zone 1 / 2 boundary with values rising to ~15-17 µg L^{-1}.

Zone 3 (5- 0 cm); ~1989 to the present day
The diatom flora in Zone 3 was markedly different from that of Zone 2. The dramatic shift in the species assemblage at the Zone 2 / 3 boundary was reflected in a sharp increase in PCA axis 1 scores. Formerly abundant taxa, such as *C.* aff. *comensis, C. comensis, F. exigua* and *C.kuetzingiana* var. *radiosa / C.rossii,* declined to minimal values within this zone while notable increases occurred in *Stephanodiscus medius*, *C. ocellata, Tabellaria flocculosa* (long) and, in particular, *A. ambigua,* which reached a value of 40%. In addition *Fragilaria crotonensis* appeared for the first time at 4 cm and increased towards the top of the core. The expanding taxa are typically associated with the plankton of lakes with moderate nutrient concentrations. Overall the percentage of planktonic taxa increased, reaching 80% in the surface sample. The species

turnover is reflected by the high SCD scores in this zone which reached a maximum of 1.86. The diatom assemblage in the surface sample is clearly very different from the assemblage found at the core bottom. There was some evidence of diatom dissolution in the samples throughout this zone particularly in *A. ambigua* and *Cyclotella* spp. valves. DI-TP values increased sharply at the Zone 2 / 3 boundary to a maximum of 34 µg L^{-1} in the 4 cm sample (1993) and, while there has been some fluctuation, have remained considerably above baseline concentrations with a value for the surface sample of 25 µg L^{-1}.

3.2 Discussion

The palaeoecological data indicate that Steinsfjorden is a naturally nutrient-poor lake, formerly supporting a diatom community associated with oligotrophic conditions. The *Cyclotella-Achnanthidium* complex found in the pre-enrichment samples has been observed in numerous large, deep, circumneutral waters and appears to represent the reference diatom community for this lake type (e.g. Bennion, 2004; Bennion *et al*., 2004). The diatom-P transfer function indicates that concentrations were relatively stable at around 10 µg L^{-1} in the early period of the lake's history.

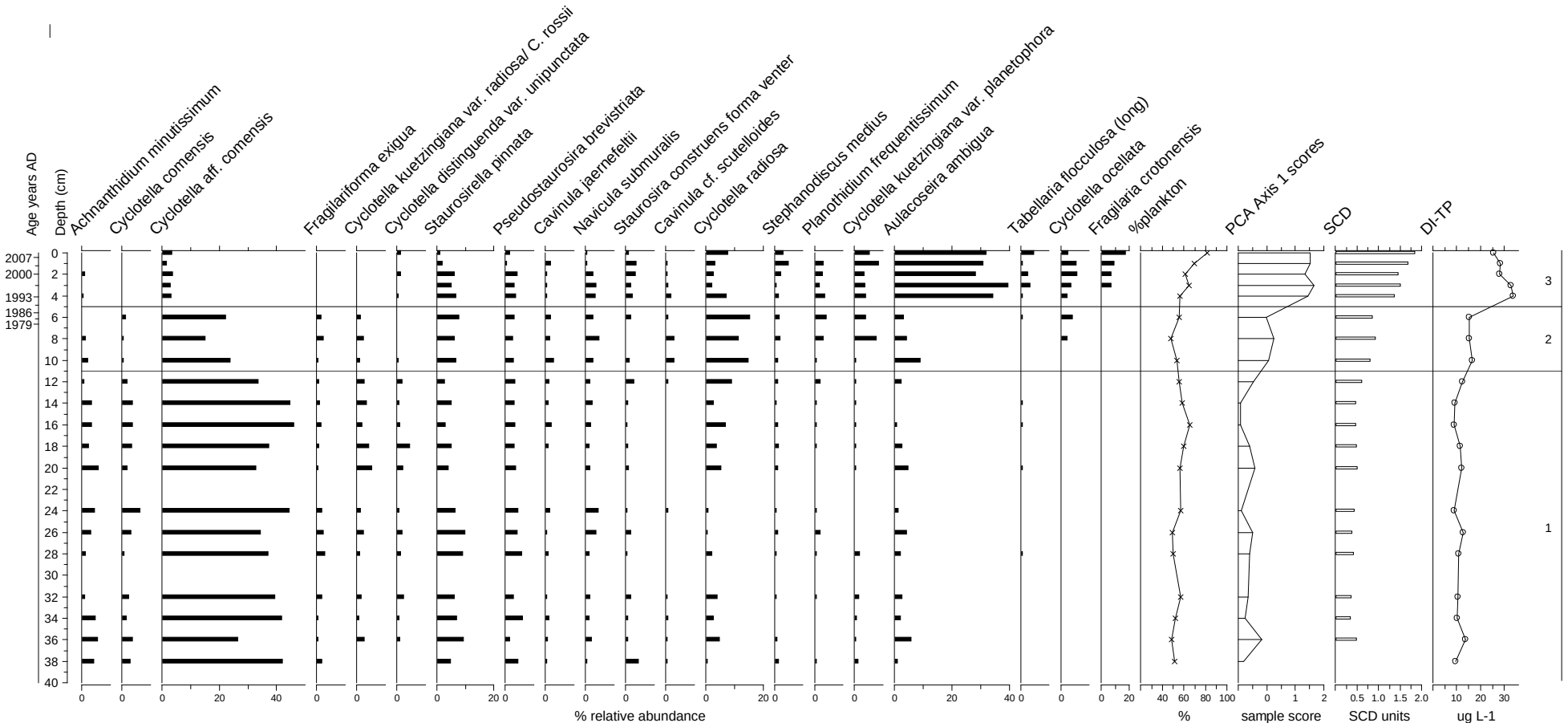
There is evidence of enrichment over the period represented by the core, starting at around the mid-1900s and followed by a second, more marked eutrophication phase from around the late 1980s. This takes the form of a shift towards diatoms associated with more productive waters and an increase in the relative importance of planktonic relative to non-planktonic diatoms. Increases in *Stephanodiscus* spp.*, Aulacoseira ambigua* and *Fragilaria crotonensis* have been observed elsewhere in association with eutrophication (e.g. Meriläinen *et al*., 2000; Anderson *et al*., 2006).The diatom-P model suggests that TP concentrations experienced an initial increase to values of ~ 15 µg L^{-1} in Zone 2, followed by a doubling of concentrations since the late 1980s to ~25-30 µg L^{-1}. Inferred values for the surface sample indicate that the lake is currently mesotrophic although the measured mean TP concentration of only 9 µg L^{-1} in summer 2008 suggests that the diatom model may over-estimate TP values for this lake. However, measured annual mean data are required for a direct comparison with the DI-TP concentrations and it is highly likely that the annual mean will be higher than the summer mean value as TP concentrations are typically at their highest in winter in deep, stratifying temperate lakes.

The increasing SCD scores towards the core surface reflect the gradual deviation of the diatom assemblages from reference conditions (i.e. those at the bottom of the core) since the mid-1900s and most notably since the late 1980s. The diatom data would, therefore, indicate that the lake has experienced a decline in ecological status. The analysis of other biological groups is recommended to assess whether they have changed in line with the shifts in the diatom assemblages.

Table 3 Results of the diatom analysis on Steinsfjorden core

Depth (cm)	No. of taxa	N2	DI-TP µg L^{-1}	SCD	PCA axis 1 scores
0	32	6.53	25	1.86	1.53
1	49	7.91	28	1.71	1.52
2	49	9.33	28	1.48	1.33
3	48	5.64	33	1.52	1.65
4	48	7.11	34	1.39	1.44
6	49	9.97	15	0.87	-0.02
8	49	15.69	15	0.95	0.24
10	62	9.71	17	0.82	0.05
12	55	6.75	12	0.64	-0.46
14	63	3.97	9	0.49	-0.93
16	55	3.78	9	0.49	-0.93
18	57	5.41	11	0.51	-0.61
20	63	7.01	12	0.53	-0.41
24	52	3.61	9	0.45	-0.90
26	57	5.98	13	0.41	-0.48
28	54	6.02	11	0.43	-0.60
32	64	5.17	11	0.39	-0.66
34	54	4.80	10	0.38	-0.77
36	64	8.49	14	0.50	-0.17
38	60	4.54	10	0.00	-0.80

Figure 1 Summary diatom diagram of the Steinsfjorden core



4 GJERSJØEN

4.1 Diatom analysis

Twenty samples were analysed for diatoms from the Gjersjøen core (Table 4). Diatoms were abundant and generally well preserved in most samples, but the 11-12 cm sample was rich in fine silt and diatoms were poorly preserved and scarce. In this sample only 100 individual valves were identified and counted. The uppermost samples in contrast contained much less silt, and many finely silicified diatoms, including *Synedra acus* var. *radians* and *Fragilaria crotonensis*, were present, indicating excellent preservation conditions. A total of 139 diatom taxa were observed in the core with between 27 and 50 taxa per sample. The samples were not particularly diverse, N2 values being < 10. The samples were generally dominated by planktonic diatoms varying from 40 to 80% of the total count. The results for the major taxa are shown in Figure 2 and the full dataset is presented in Appendix 1. Most of the abundant taxa were represented in the diatom-TP training set with over 80% of the assemblage being represented in all samples, except for the 11-12 cm where representation was only 78%.

There were marked changes in the assemblages during the period represented by the core with four zones identified by cluster analysis. The chronology produced by DHI (2009b) was used to assign dates to the upper 12 cm of the core.

Zone 1 (44-12 cm); pre-~1870
Zone 1 was co-dominated by the planktonic taxa *Cyclotella radiosa* and *Aulacoseira subborealis* with modest amounts of the non-planktonic species *Achnanthidium minutissimum*. This assemblage is typical of deep, stratifying lakes of low to moderate productivity. There was a notable peak of *Cyclotella comensis* in the 40 cm sample where it reached a relative abundance of 25% but it was present in only small percentages in other samples in this zone. The PCA axis 1 scores and SCD scores remained low within this zone indicating little floristic change. The DI-TP concentrations fluctuated in the range ~15-20 µg L^{-1}, thereby indicating mesotrophic conditions.

Zone 2 (12-5 cm); ~1870-1967
The assemblages in Zone 2 were broadly similar to those in Zone 1 with the exception that *Aulacoseira subborealis* was present in lower relative abundances and several non-planktonic taxa increased in abundance including *Fragilariforma virescens* and *Navicula viridula*. Consequently the planktonic component of the assemblage declined. This may be due in part to the change in sediment composition to fine silt with poor diatom preservation in the 11-12 cm sample in particular. The reasons for the change in sediment composition are not known but the diatom data indicate that it may have resulted in habitat shifts within the lake. Given that the species shifts were relatively subtle, the PCA axis 1 scores and SCD scores remained low within this zone, aand the DI-TP values remained at ~15 µg L^{-1}.

Zone 3 (5-2 cm); ~1967-1986
This zone was characterized by a major increase in the abundance of *Fragilaria crotonensis* and concomitant declines in the formerly abundant taxa *Cyclotella radiosa* and *Aulacoseira subborealis*. Several other planktonic taxa increased or appeared for the first time, namely *Asterionella formosa*, *Cyclotella pseudostelligera*, *Synedra* spp., *Diatoma tenue* var. *elongatum* and *Stephanodiscus parvus*. These taxa are typically associated with nutrient-rich waters and signal enrichment of the lake. Consequently a marked change was observed in the PCA axis 1 scores, and SCD scores increased to 1.5, reflecting major floristic change at this point in the record and a substantial deviation from the assemblages in Zone 1 of the core. The DI-TP values increased from 15 µg L^{-1} to 20 µg L^{-1}.

Zone 4 (2-0 cm); ~ 1986--2009

The main feature of this upper zone was the expansion of *Cyclotella comensis* towards the surface of the core to 40% and the relative decline in *Fragilaria crotonensis*. The other planktonic taxa that increased in Zone 3 continued to be present in Zone 4 including *Asterionella formosa*, *Cyclotella pseudostelligera*, *Synedra* spp., *Diatoma tenue* var. *elongatum* and *Stephanodiscus parvus*. In addition small amounts of *Stephanodiscus hantzschii* were observed. This is a somewhat mixed assemblage comprising taxa associated with productive waters but with a large component of *C. comensis* which is typically found in nutrient-poor waters. The species shifts were reflected by a decrease in PCA axis 1 scores. However the SCD scores remained high at ~1.5 as the assemblage was still significantly different from that at the base of the core. The increase in *C. comensis* resulted in a decline in DI-TP concentrations towards the top of the core to 11 µg L^{-1} which is in reasonable agreement with the measured mean TP value of 14 µg L^{-1} in summer 2008.

4.2 Discussion

The palaeoecological data indicate that Gjersjøen formerly supported a diatom community associated with oligotrophic to mesotrophic conditions, comprised largely of planktonic species. The diatom-P transfer function indicates that concentrations were relatively stable at around 15-20 µg L^{-1} in the early period of the lake's history. The flora is indicative of slightly more productive waters than that of Steinsfjorden and Lyseren suggesting that Gjersjøen may be a more nutrient-rich system. There is evidence of enrichment in Zone 3 of the core, estimated to occur from ~1967 AD, with a sudden increase in taxa associated with more productive waters, particularly *Fragilaria crotonensis*, which has been observed in many lakes with the onset of enrichment (e.g. Sabater & Haworth, 1995).

Gjersjøen is a site from which we have an earlier core (GJER1), collected in 1996 under the EU FP4 Project BIOMASS (Neunlist & Laczko, 1999), and the summary diatom data are shown in Figure 3. We expected the current core to contain a very similar record to the earlier core with the addition of more recent sediment representing the last 13 years. Although the taxonomic composition and the overall sequence of changes are indeed very similar, the two cores differ from each other in a number of respects. Firstly, the sediment accumulation rates of the two cores are markedly different with GJER1 having a sedimentation rate approximately four times faster than the core collected in 2009 (i.e. 30 cm accumulated in 70 years in GJER1 compared with only 8 cm over the same period in the 2009 core). Hence the recent core provides a long record dating back several hundred years while GJER1 provides a more highly resolved sequence of changes in the diatom phytoplankton over the last 70-80 years. Secondly, the relative abundances of the main taxa differ quite significantly between the cores. For example, there is a peak in *Asterionella formosa* at ~23 cm (~1950) of 50% in GJER1 that has no apparent equivalent in the 2009 core and the proportion of small *Stephanodiscus* taxa seen at the top of the early core is considerably higher than in the current one. Nevertheless, there is general agreement in the timing of the shift to an assemblage indicating enrichment in that the rise in *Asterionella formosa* occurs in the mid to late-1940s in GJER1 and in ~1950 in the recent core, and the pronounced increase in *Fragilaria crotonesis* occurs in the mid-1960s in both cores.

The uppermost two samples of the more recent core show a return to dominance of *Cyclotella comensis*, one of the dominant pre-eutrophication taxa in GJER1 and to a lesser extent in the 2009 core. This return is not seen in GJER1 and probably indicates a response to a reduction in nutrient loading that must have taken place between the dates of the two cores. Indeed the chronology for the recent core dates the upper two samples to post-1996. The recent appearance of *C. comensis* in abundance is highly significant and it would be worth taking an additional core or series of cores in different parts of the lake to reconstruct this apparent evidence for re-oligotrophication in more detail.

Table 4 Results of the diatom analysis on the Gjersjøen core

Depth (cm)	No. of taxa	N2	DI-TP µg L^{-1}	SCD	PCA axis 1 scores
0	39	5.01	11	1.57	0.71
1	34	8.06	16	1.55	0.80
2	35	5.33	20	1.66	1.25
3	29	3.40	19	1.58	1.41
4	31	5.44	19	1.57	1.27
5	40	6.08	18	1.22	0.95
6	39	9.94	14	0.74	-0.06
7	50	5.66	18	0.48	-0.41
9	45	6.54	15	0.59	-0.31
11	35	8.39	13	0.68	-0.23
13	41	5.54	18	0.46	-0.40
15	42	8.14	12	0.57	-0.17
17	39	6.02	16	0.37	-0.46
19	44	4.75	20	0.34	-0.62
24	31	6.12	13	0.61	-0.40
28	27	4.17	18	0.35	-0.74
32	33	3.87	21	0.28	-0.81
36	32	3.31	22	0.16	-0.91
40	40	6.73	11	0.72	-0.02
44	38	3.61	22	0.00	-0.84

Figure 2 Summary diatom diagram of the Gjersjøen core collected in 2009

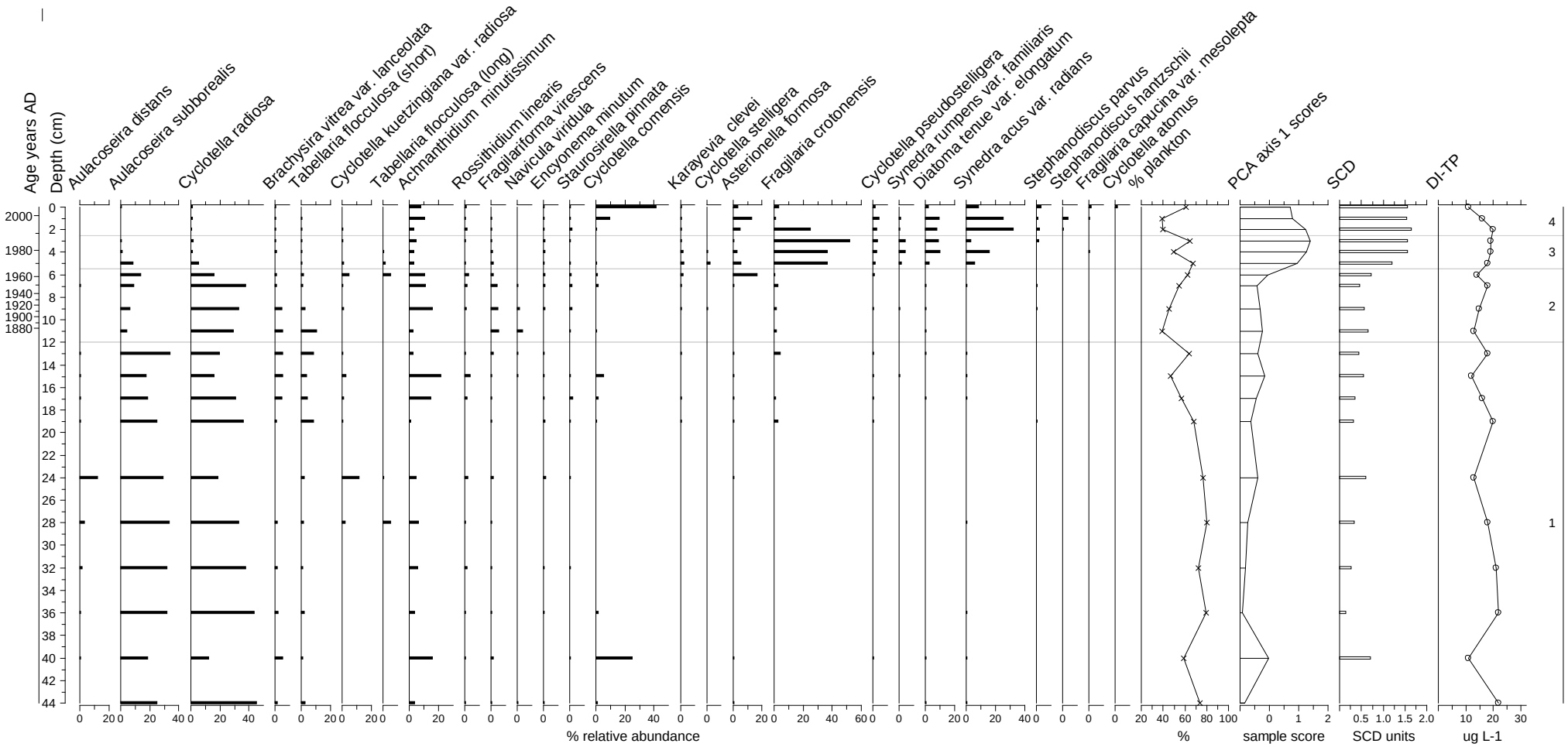
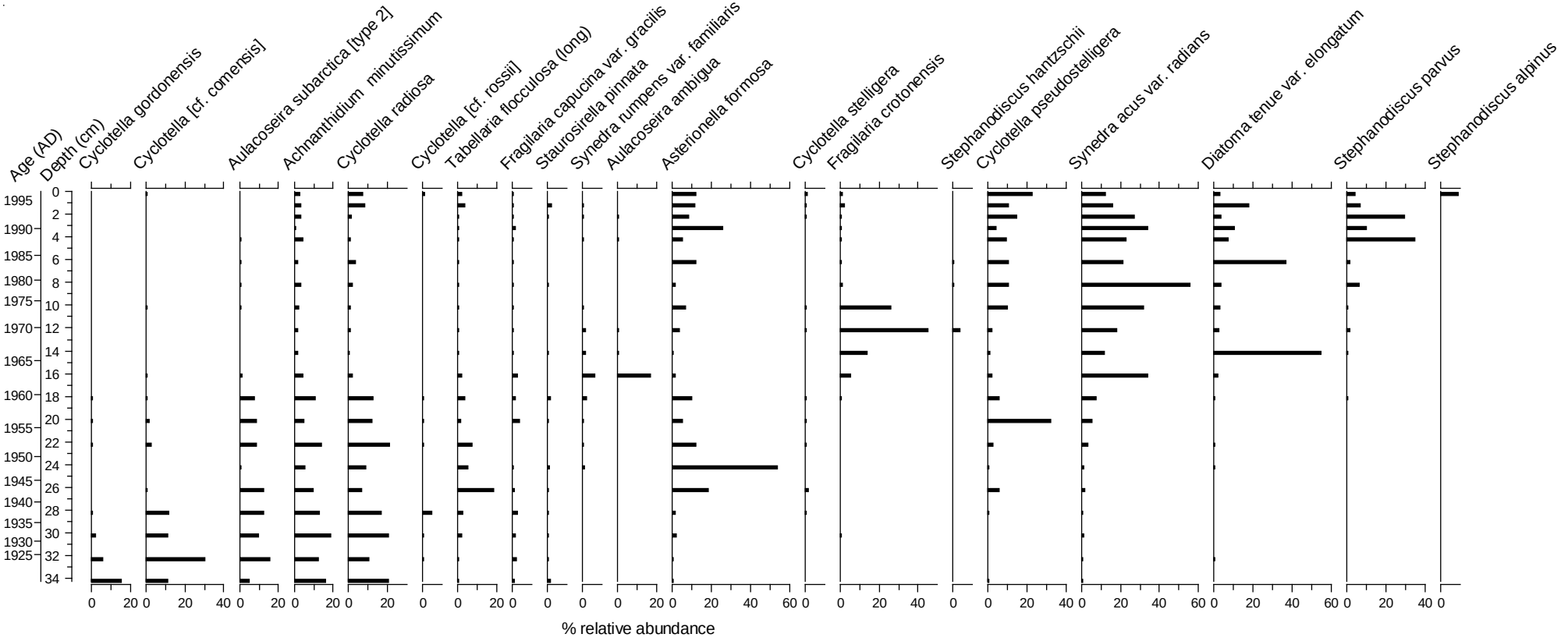


Figure 3 Summary diatom diagram of the Gjersjøen core, GJER1, collected in 1996



5 LYSEREN

5.1 Diatom analysis

Twenty samples were analysed for diatoms in the Lyseren core (Table 5). A total of 146 diatom taxa were observed in the core with between ~39 and 63 taxa per sample. The samples were relatively diverse, N2 values being generally in the range 10 to 15, and the assemblages were comprised of approximately equal percentages of planktonic and non-planktonic taxa. The results for the major taxa are shown in Figure 4 and the full dataset is presented in Appendix 1. Most of the abundant taxa were represented in the diatom-TP training set with over 75% of the assemblage being represented in the majority of samples. However, the two lowermost samples and those in the section 5-8 cm had poorer representation ranging from 68-74%, largely due to the absence of *Cyclotella ocellata* and *Cyclotella atomus* from the training set.

There were marked changes in the assemblages during the period represented by the core with three zones identified by cluster analysis. The chronology produced by DHI (2009b) was used to assign dates to the upper 9 cm of the core.

Zone 1 (31-10 cm); pre-~1850
Zone 1 was dominated by the long form of *Tabelllaria flocculosa* which accounted for approximately 20-25% of the assemblage. *Cyclotella rossii, C. ocellata* and *Asterionella formosa* were also common and at relatively stable abundances throughout the zone. *Cyclotella* aff. *comensis* was present at low abundance in most of the core, but dominated one sample (22-23 cm) where it accounted for 43% of the total assemblage. *Cyclotella pseudostelligera* was also present in low numbers throughout the core, but reached its maximum abundance (18%) in the top of Zone 1 (10-11 cm). These taxa are typical components of the plankton of relatively nutrient-poor lakes. The only benthic species present in considerable numbers were *Achnanthidium minutissimum* and *Rossithidium pusillum*. Generally the samples were relatively species rich with the remainder of the assemblage comprised of small percentages of benthic species including several *Psammothidium* species, *Brachysira vitrea,* small Naviculoid taxa, *Fragilariaforma exigua* and other "*Fragilaria*" species. The assemblage was relatively stable with only minor fluctuations in the relative abundances of the taxa, with the exception of the 22-23 cm sample where the unexplained peak in *C.* aff. *comensis* occurred. The PCA axis 1 scores reflect this stability, showing only minor changes within this zone. Variation in the SCD dissimilarity scores between the bottom sample and the other samples in Zone 1 were relatively low indicating low floristic change up to the Zone 1 / 2 boundary. The DI-TP reconstruction suggests that TP concentrations were relatively stable in Zone 1 at ~10-12 µg L^{-1}, thereby indicating relatively nutrient-poor conditions.

Zone 2 (10-4 cm): ~1850-1980
This zone was characterized by a major decrease in the abundance of the planktonic (long) form of *Tabellaria flocculosa,* which was absent from level 6-7 cm. Conversely, *T. flocculosa* (short) was more abundant in this zone along with slight increases in *C.* aff. *comensis, C. atomus* and *A. minutissimum. Asterionella formosa, C. rossii* and *C. ocellata* remained relatively abundant with percentage abundances similar to those in Zone 1. The assemblages remained relatively species rich with a similar non-planktonic flora to that seen in Zone 1. The PCA axis 1 scores increased at the Zone 1 / 2 boundary reflecting the species changes. The SCD scores were higher than in Zone 1 (0.5-0.76) indicating deviation from the community at the core bottom. The DI-TP reconstruction suggests a slight increase in TP concentrations in this zone with values rising to ~16 µg L^{-1}. The DI-TP values must be interpreted with caution in this part of the core as several of the abundant taxa were not represented in the training set data and, therefore, the reliability of the model output is much reduced.

Zone 3 (4-0 cm); ~1980-2009

Whereas Zones 1 and 2 saw mainly shifts in abundance between the common taxa, Zone 3 was characterised by the occurrence of several species which were either absent from or were present at very low abundances throughout the lower core. Notably *Cyclotella radiosa, Stephanodiscus medius* and *Fragilaria crotonensis* appeared for the first time at 4-5 cm and all increased towards the top of the core. *Tabellaria fenestrata* was present throughout the core (sometimes only girdle bands seen), but only became abundant in the upper few samples. This zone also saw the return of the planktonic (long) form of *T. flocculosa* as well as a decline in *C. rossii* and *C. ocellata* and a significant decrease in the abundance of *Asterionella formosa* from 29% at 4 cm to only 4% in the surface sediment. The diatom flora in the surface sample is clearly very different from that found at the core bottom, as reflected by the high SCD score (> 1). The new arrivals and increasing taxa in this upper zone are typically associated with lakes with intermediate nutrient concentrations (e.g. Bennion *et al*., 2008) and hence suggest a slight increase in productivity. However, the DI-TP values do not indicate any further enrichment in Zone 3, instead suggesting a slight decline in concentrations. This may partly be due to the uncertainties in the reconstructed values in Zone 2 as well as the poor representation of *S. medius* in the training set. Nevertheless, the reconstructed value for the surface sediment of 12 µg L^{-1} is in good agreement with the measured mean TP value of 11 µg L^{-1} in summer 2008.

5.2 Discussion

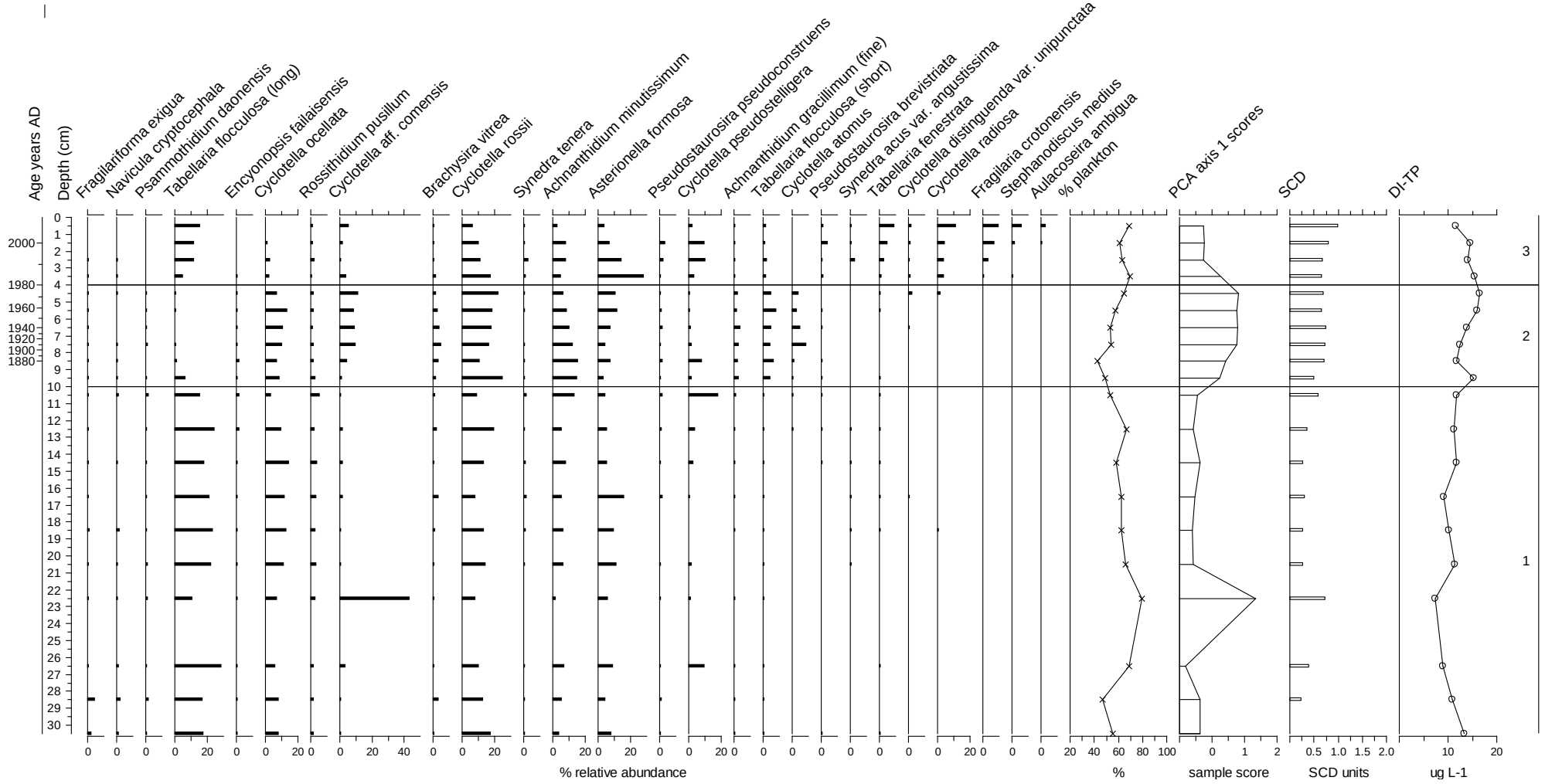
The palaeoecological data indicate that Lyseren is a naturally nutrient-poor lake, formerly supporting a diatom community associated with oligotrophic to slightly mesotrophic conditions. The flora in the early period of the core is comprised of planktonic species and numerous benthic taxa from a range of marginal and epiphytic habitats. The diatom-P transfer function indicates that concentrations were relatively stable at around 10-12 µg L^{-1} in the early period of the lake's history. The flora is indicative of slightly more productive waters than that of Steinsfjorden but slightly less productive waters than that of Gjersjøen suggesting that Lyseren may be intermediate between the two in terms of its baseline trophic status.

There is evidence of enrichment over the period represented by the core although this is somewhat equivocal. In contrast to Steinsfjorden where a gradual succession of species was observed, the shifts above 10 cm (post-~1850 AD) in the Lyseren core are rather noisy and difficult to interpret. The decline in the planktonic form of *Tabellaria flocculosa* and concomitant increase in the abundance of benthic species in Zone 2 suggests that there may have been some habitat shifts in the lake but, in the absence of supporting data, this interpretation is tentative. The resurgence of the planktonic *T. flocculosa* in Zone 3, dated to occur at ~1980, along with the appearance of several previously unrecorded taxa (e.g. *Cyclotella radiosa, Stephanodiscus medius* and *Fragilaria crotonensis*) typically associated with mesotrophic conditions, suggests enrichment but this is not reflected in the DI-TP reconstructed values for reasons explained above. Nevertheless, the high species turnover indicates that the current diatom flora of Lyseren is considerably different from that of the early period and hence the lake has deviated from reference condition. We tentatively conclude that the lake has experienced a decline in ecological status since ~1980 but further proxies are required in order to draw firmer conclusions.

Table 5 Results of the diatom analysis on the Lyseren core

Depth (cm)	No. of taxa	N2	DI-TP µg L^{-1}	SCD	PCA axis 1 scores
0	40	12.98	12	1.01	-0.25
1	44	15.32	14	0.81	-0.22
2	41	12.76	14	0.68	-0.26
3	45	7.70	15	0.67	0.25
4	45	10.26	16	0.70	0.81
5	44	10.41	16	0.68	0.76
6	44	12.07	14	0.76	0.78
7	39	11.88	13	0.74	0.77
8	47	14.54	12	0.72	0.42
9	49	9.35	15	0.52	0.23
10	40	10.31	12	0.61	-0.44
12	46	8.12	11	0.38	-0.58
14	55	11.08	12	0.29	-0.37
16	47	9.55	9	0.31	-0.53
18	52	9.00	10	0.28	-0.61
20	53	9.11	11	0.28	-0.57
22	42	4.53	7	0.74	1.34
26	46	7.88	9	0.41	-0.81
28	63	14.52	11	0.26	-0.36
30	63	11.96	13	0.00	-0.36

Figure 4 Summary diatom diagram of the Lyseren core



6 SUMMARY

The palaeoecological study has successfully determined the reference communities and the degree of ecological change for the three lakes.

The data indicate that Steinsfjorden is a naturally nutrient-poor loch, formerly supporting a diatom community typical of oligotrophic lakes. The study has shown that Steinsfjorden has experienced major ecological shifts over the period represented by the sediment core. This shift has taken the form of a relative increase in diatom taxa associated with nutrient-rich waters, starting in the mid-1900s but with a second and more marked enrichment phase since ~1989.

The data indicate that Gjersjøen formerly supported a diatom community associated with oligotrophic to mesotrophic conditions, comprised largely of planktonic species. There is evidence of enrichment in the upper core with a sudden increase in taxa associated with more productive waters since the mid-1960s, particularly *Fragilaria crotensis*. However, the uppermost two samples, dated to post-1996, show a return to dominance of *Cyclotella comensis* which probably indicates a response to a reduction in nutrient loading. The collection of further cores is recommended to reconstruct this apparent evidence for re-oligotrophication in more detail.

The data indicate that Lyseren is a naturally nutrient-poor lake, formerly supporting a diatom community associated with oligotrophic to slightly mesotrophic conditions. The reference assemblages suggest that the lake is most likely a more productive system than Steinsfjorden but less productive than Gjersjøen. The study has shown that Lyseren has experienced marked ecological shifts over the several hundred year period represented by the sediment core although these are difficult to interpret in terms of trophic changes. The appearance of a number of taxa commonly associated with intermediate nutrient concentrations in the upper core, dated to post-~1980, suggests enrichment but this is not reflected in the DI-TP reconstructed values owing to poor representation of several major taxa in the training set.

7 REFERENCES

Anderson, N.J., Rippey, B. and Stevenson, A.C. 2006. Change to a diatom assemblage in a eutrophic lake following point source nutrient re-direction: a palaeolimnological approach. *Freshwater Biology,* **23**, 205-247.

Battarbee R.W., Jones V.J., Flower R.J., Cameron N.G., Bennion H., Carvalho L. & Juggins S. 2001. Diatoms. In: Smol J.P, Birks H.J.B. & Last W.M (eds.), *Tracking Environmental Change Using Lake Sediments. Volume 3: Terrestrial, Algal, and Siliceous Indicators*, Kluwer Academic Publishers, Dordrecht, The Netherlands, pp. 155 -202.

Bennion, H. (ed.) 2004. Identification of reference lakes and evaluation of palaeoecological approaches to define reference conditions for UK (England, Wales, Scotland & Northern Ireland) ecotypes. *Final Report to the Scotland and Northern Ireland Forum for Environmental Research, Project WFD08*: 149 pp.

Bennion, H., Fluin, J. & Simpson, G.L. 2004. Assessing eutrophication and reference conditions for Scottish freshwater lochs using subfossil diatoms. *Journal of Applied Ecology,* **41**, 124-138.

Bennion H., Clarke G., Davidson T., Morley D., Rose N., Turner S. & Yang H. 2008. Palaeoecological study of seven mesotrophic lochs. *Final Report to SEPA and SNH. ECRC Research Report, No 121*; 105 pp.

DHI 2009a. ^{210}Pb-datering af en sedimentkerne fra NIVA, Norge. Rapport Projekt nr. 11091401, September 2009, 18 pp

DHI 2009b. ^{210}Pb-datering af to sedimentkerner fra NIVA, Norge. Rapport Projekt nr. 11091401, December 2009, 23 pp

Grimm, E.C. 1987. CONISS: A Fortran 77 program for stratigraphically constrained cluster analysis by the method of incremental sum of squares. *Computer and Geosciences,* **13**, 13-35.

Grimm, E.C. 2004. TGView version 2.0.2. Illinois State Museum, Springfield, USA.

Hill, M.O. & Gauch, H.G. 1980. Detrended correspondence analysis, an improved ordination technique. *Vegetatio,* **42**, 47-58.

Juggins. S. 1991. ZONE version 1.2 User guide. University of Newcastle, Newcastle upon Tyne, UK.

Juggins, S. 2003. C^2 User guide. Software for ecological and palaeoecological data analysis and visualisation. University of Newcastle, Newcastle upon Tyne, UK, 69 pp.

Krammer, K. & Lange-Bertalot, H. 1986-1991. Bacillariophyceae. 1-4 Teil:. *In*: H. Ettl, J. Gerloff, H. Heynig & D. Mollenhauer, eds. *Süsswasserflora von Mitteleuropa*. Suttgart: Gustav Fischer Verlag.

Meriläinen J.J., Hynynen J., Teppo A., Palomäki A., Granberg K. & Reinikainen P. 2000. Importance of diffuse nutrient loading and lake level changes to the eutrophication of an originally oligotrophic boreal lake: a palaeolimnological diatom and chironomid analysis. *Journal of Paleolimnology*, **24**, 251–270.

Neunlist, S. & Laczko, E. (eds) 1999. *BIOMASS: Biodiversity of Microorganisms in Aquatic Systems*. Final Report, Volumes I and II. Contract No DG XII ENV4-CT95-0026. ENSCMu, Mulhouse, France.

Overpeck, J.T., Webb, T. & Prentice, I.C. 1985. Quantitative interpretation of fossil pollen spectra - dissimilarity coefficients and the method of modern analogs. *Quaternary Research,* **23**, 87-108.

Sabater, S. & Haworth, E.Y. 1995. An assessment of recent trophic changes in Windermere South Basin (England) based on diatom remains and fossil pigments. *Journal of Paleolimnology*, **14**, 151-163.

Simpson G.L 2005. *Defining restoration targets for acidified upland lakes using diatom and cladoceran sub-fossil remains and the modern analogue approach*. Unpublished Ph.D Thesis. University of London.

Simpson, G.L., Shilland, E. M., Winterbottom, J. M. & Keay, J. 2005. Defining reference conditions for acidified waters using a modern analogue approach. *Environmental Pollution*, **137,** 119-133.

ter Braak, C.J.F. & Juggins, S. 1993. Weighted averaging partial least squares (WA-PLS): an improved method for reconstructing environmental variables from species assemblages. *Hydrobiologia,* **269/270**, 485-502.

ter Braak, C.J.F. & Prentice, I.C. 1988. A Theory of Gradient Analysis. *Advances in Ecological Research*, **18**, 271-317.

ter Braak, C. J. F. & van Dam, H. 1989. Inferring pH from diatoms: a comparison of old and new calibration methods. *Hydrobiologia,* **178**, 209-223.

APPENDIX 1 DIATOM DATA

Diatom data for the Steinsfjorden core (% relative abundance)

% data									Depth	(cm)											
Full Name	**Code**	**0**	**1**	**2**	**3**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**24**	**26**	**28**	**32**	**34**	**36**	**38**
Achnanthes conspicua	AC023A	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	0.29	0.00
Achnanthes spp	AC9999	0.00	0.58	0.00	0.00	0.00	1.23	0.00	1.41	0.53	0.67	0.00	0.00	0.26	0.92	1.05	1.08	0.00	0.46	1.15	0.48
Achnanthidium minutissimum	AC013A	0.00	0.29	1.20	0.23	0.57	0.00	1.48	2.25	1.07	3.79	3.60	2.72	6.04	4.85	3.42	1.62	1.25	5.07	5.75	4.60
Amphipleura pellucida	AP001A	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	0.25	0.00	0.00	0.48
Amphora fogediana	AM010A	0.00	0.58	0.30	1.16	0.85	0.31	2.37	0.28	1.33	0.67	1.35	1.23	1.05	0.23	0.26	1.35	1.00	0.92	0.29	0.97
Amphora inariensis	AM013A	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	0.53	0.27	0.50	0.00	0.00	0.00
Amphora libyca	AM011A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Amphora montana	AM084A	0.00	0.00	0.00	0.00	0.00	0.00	0.59	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
Amphora pediculus	AM012B	0.00	0.29	0.30	0.93	1.14	0.62	0.30	0.00	0.53	0.22	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.57	1.21
Amphora spp	AM9999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Amphora veneta	AM004A	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	0.26	0.00	0.00	0.00	0.00	0.00
Aulacoseira ambigua	AU002A	32.23	31.01	28.53	39.68	34.47	3.40	4.45	9.30	2.67	0.22	1.13	2.96	4.99	1.62	4.47	2.43	3.00	2.30	6.03	1.21
Aulacoseira distans	AU005A	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.90	0.00	0.26	0.00	0.26	0.54	0.00	0.00	0.29	0.00
Aulacoseira spp	AU9999	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	0.29	0.00
Brachysira	BR9999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.22	0.00	0.00	0.00	0.46	0.00	0.00	0.00	0.00	0.00	0.00
Brachysira neoexilis	BR010A	0.00	0.00	0.00	0.00	0.28	0.31	0.00	0.28	0.00	0.45	0.45	0.00	0.26	0.23	0.53	1.08	0.25	0.23	0.00	0.73
Brachysira vitrea	BR001A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.22	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.29	0.00
Caloneis bacillum	CA002A	0.00	0.87	0.00	0.00	0.00	0.62	0.59	0.28	0.00	0.22	0.00	0.49	0.00	0.23	0.26	0.00	0.25	0.00	0.00	0.00
Caloneis silicula	CA003A	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	0.27	0.00	0.00	0.00	0.00
Caloneis spp	CA9999	0.00	0.29	0.30	0.46	0.00	0.00	0.00	0.00	1.07	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.23	0.29	0.73
Cavinula cf. scutelloides	NA9991	0.30	0.58	0.90	0.93	1.99	0.93	3.26	3.10	1.07	0.00	0.00	0.25	0.00	1.15	0.26	0.27	0.75	0.92	0.86	0.73
Cavinula cocconeiformis	NA032A	0.00	0.00	0.00	0.23	0.28	0.31	0.30	0.85	0.27	0.45	0.00	0.25	0.00	0.23	0.00	0.00	0.00	0.23	0.29	0.24
Cavinula jaernefeltii	NA002A	0.30	2.03	0.90	0.70	0.85	2.16	1.78	3.10	1.60	1.34	2.25	1.23	0.26	1.85	0.79	1.35	0.50	1.61	1.15	0.73
Chamaepinnularia soehrensis var. hassica	NA048D	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	0.46	0.00	0.00
Cocconeis neothumensis	CO067A	1.51	1.16	1.20	0.93	0.28	0.62	0.00	0.00	0.00	0.00	0.23	0.49	0.26	0.00	0.26	0.27	0.25	0.00	0.00	0.48
Cocconeis placentula var. euglypta	CO001B	0.00	0.00	0.30	0.23	0.00	0.31	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.46	0.00	0.27	0.00	0.00	0.29	0.24
Cocconeis placentula var. placentula	CO001A	2.71	1.16	0.60	0.23	0.00	0.00	0.59	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cocconeis spp (raphe valves)	CO9999	1.51	0.29	0.60	0.23	0.00	0.31	0.30	0.00	0.00	0.45	0.00	0.00	0.26	0.00	0.26	0.00	0.25	0.00	0.00	0.48
Cyclotella aff. comensis	CY9991	3.61	1.74	3.90	3.25	3.42	22.53	15.43	23.94	33.87	45.09	46.17	37.53	33.07	44.80	34.74	37.30	39.75	41.94	26.72	42.37
Cyclotella comensis	CY010A	0.00	0.00	0.00	0.23	0.00	1.54	0.59	0.56	2.13	4.02	4.05	3.70	2.10	6.47	3.42	1.08	2.75	1.84	4.02	3.15
Cyclotella cyclopuncta	CY059A	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	0.48
Cyclotella distinguenda var. unipunctata	CY028B	1.51	0.29	1.50	0.00	0.85	0.00	0.00	0.85	2.13	1.12	1.35	4.69	2.36	1.15	2.11	1.62	2.75	1.15	1.44	0.00
Cyclotella krammeri	CY054A	0.00	1.16	0.60	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

% data									Depth	(cm)											
Full Name	**Code**	**0**	**1**	**2**	**3**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**24**	**26**	**28**	**32**	**34**	**36**	**38**
Cyclotella kuetzingiana	CY006A	0.00	0.00	0.00	0.00	0.00	0.00	0.89	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
Cyclotella kuetzingiana var. radiosa/ C. rossii	CY006C	0.00	0.00	0.00	0.00	0.28	1.54	2.67	1.41	2.93	3.79	2.03	4.44	5.51	1.62	2.63	1.35	1.75	0.92	2.87	0.24
Cyclotella kuetzingiana ver. planetophora	CY006B	5.42	8.70	3.60	3.94	4.27	4.32	8.01	0.85	0.53	0.45	0.90	0.49	0.52	0.00	0.26	2.16	1.75	0.92	0.86	1.45
Cyclotella ocellata	CY009A	2.71	5.80	6.01	3.71	2.56	4.32	2.37	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.25	0.00	0.00	0.00
Cyclotella pseudostelligera	CY002A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cyclotella radiosa	CY019A	7.83	3.48	3.00	2.32	7.41	15.43	11.57	14.93	9.33	2.90	6.98	3.95	5.51	0.92	0.53	2.43	4.25	3.00	4.89	0.73
Cyclotella spp	CY9999	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cymbella cistula	CM006A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cymbella lapponica	CM085A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cymbella spp	CM9999	0.00	0.29	0.00	0.00	0.85	0.00	0.59	0.85	0.00	0.00	0.00	0.49	0.26	0.46	0.26	0.27	0.25	0.00	0.00	0.00
Denticula kuetzingii	DE003A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.25	1.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Denticula tenuis	DE001A	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	0.50	0.00	0.86	0.00
Diatoma mesodon	DT021A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.24
Diatoma sp.	DT9999	0.00	0.00	0.00	0.00	0.28	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 elliptica	DP009A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diploneis oblongella	DP007A	0.00	0.87	0.30	0.46	1.14	0.62	1.48	0.56	0.53	0.89	0.23	0.74	1.05	0.00	0.00	0.00	0.00	0.69	0.86	0.00
Diploneis parma	DP065A	0.00	0.00	0.00	0.00	0.00	0.93	0.89	0.28	0.00	0.00	0.00	0.00	0.00	0.69	0.53	0.81	0.50	0.00	0.00	0.48
Diploneis pseudovalis	DP053A	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
Diploneis spp	DP9999	0.00	0.00	0.00	0.00	0.00	0.62	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 subovalis	DP061A	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	0.69	0.00	1.08	0.25	0.00	0.29	0.00
Encyonema affine	CM022A	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	0.00	0.00	0.00	0.00
Encyonema cespitosum	CM070A	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	0.29	0.00
Encyonema gaeumannii	CM020A	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	0.29	0.00
Encyonema gracile	CM018A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Encyonema minutum	CM031A	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	0.26	0.00	0.00	0.46	0.00	0.00
Encyonema silesiaca	CM103A	0.00	0.00	0.90	0.00	0.00	0.31	0.00	0.00	1.87	0.00	0.68	1.23	0.52	0.23	0.53	0.00	0.50	0.69	0.86	0.24
Encyonopsis cesatii	CM015A	0.00	0.00	0.00	0.23	0.00	0.31	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.54	0.75	0.23	0.00	0.00
Encyonopsis failaisensis	CM049A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Encyonopsis microcephala	CM004A	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.23	0.00	0.00
Encyonopsis similis	CM104A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eolimna minima	NA042A	0.00	0.00	0.90	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.50	0.00	0.00	0.00
Eolimna subminuscula	NA134A	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	0.92	0.00	0.00
Epithemia adnata	EP007A	0.30	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
Eucocconeis alpestris	AC025B	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	0.00
Eucocconeis flexella	AC025A	0.00	0.00	0.00	0.00	0.00	0.00	0.30	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
Eucocconeis laevis	AC083A	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.45	0.00	0.79	0.23	0.00	0.00	0.00	0.00	0.00	0.24
Eunotia flexuosa	EU017A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eunotia pectinalis	EU002A	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	0.29	0.00

% data									Depth	(cm)											
Full Name	**Code**	**0**	**1**	**2**	**3**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**24**	**26**	**28**	**32**	**34**	**36**	**38**
Fallacia helensis	NA417A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fallacia subhamulata	NA075A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fragilaria capucina	FR009A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fragilaria capucina var. gracilis	FR009H	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.28	0.00	0.22	0.23	0.49	0.52	0.00	0.26	0.00	0.75	1.15	0.86	1.21
Fragilaria capucina var. rumpens	FR009G	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	0.24
Fragilaria crotonensis	FR008A	17.77	9.86	7.81	7.66	0.57	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 spp	FR9999	0.00	0.00	0.00	0.23	0.00	0.31	0.89	0.56	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.00
Fragilaria vaucheriae var. vaucheriae	FR007A	0.60	0.00	0.30	0.46	0.00	0.00	0.30	0.00	0.00	0.22	0.68	0.49	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.24
Fragilariforma exigua	FR064A	0.00	0.29	0.00	0.00	0.28	1.85	2.67	0.56	1.07	1.34	1.80	0.99	0.79	2.08	2.63	3.24	2.00	0.69	0.57	2.18
Frustulia rhomboides	FU002A	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	0.57	0.00
Geissleria kriegeri	NA466A	0.00	0.00	0.00	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	0.00	0.00	0.00
Gomphoneis olivaceum	GM001A	0.30	0.00	0.30	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00
Gomphonema acuminatum	GO006A	0.00	0.29	0.00	0.00	0.00	0.31	0.00	0.00	0.53	0.22	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gomphonema gracile	GO004A	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
Gomphonema parvulum	GO013A	0.00	0.58	0.00	0.23	0.28	0.00	0.30	0.00	0.00	0.22	0.00	0.49	0.00	0.23	0.00	0.00	0.00	0.00	0.57	0.00
Gomphonema pumilum	GO080A	0.00	0.29	0.30	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
Gomphonema spp	GM9999	0.60	0.29	0.00	0.46	0.28	0.31	0.00	0.00	0.00	0.45	0.45	0.25	0.52	0.23	0.26	0.00	0.25	0.00	0.00	0.00
Gomphonema subtile	GO008A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.49	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gyrosigma acuminatum	GY005A	0.00	0.29	0.30	0.00	0.28	0.00	0.00	0.00	0.53	0.00	0.23	0.00	0.00	0.00	0.26	0.00	0.25	0.00	0.00	0.00
Hannaea arcus	HN001A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hippodonta costulata	NA299A	0.00	0.00	0.00	0.00	0.00	0.31	0.30	0.85	1.07	1.56	0.00	0.74	0.79	1.15	1.05	1.08	0.25	0.46	0.00	0.00
Hippodonta hungarica	NA066B	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	0.57	0.73
Hippodonta lueneburgensis	NA066C	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.28	0.00	0.00	0.00	0.00	0.00	0.23	0.53	1.35	1.00	1.61	1.44	0.00
Karayevia clevei	AC006A	0.00	0.58	0.30	0.46	1.14	0.93	0.30	0.56	0.80	0.00	0.00	0.00	0.00	0.00	0.26	0.54	1.50	0.00	0.00	0.24
Karayevia laterostrata	AC018A	0.30	0.00	0.30	0.46	0.85	0.93	0.30	0.00	0.27	0.00	0.45	0.00	0.79	0.46	0.00	0.27	0.00	0.00	0.00	0.00
Karayevia oblongella	AC143A	0.00	0.29	0.30	0.00	0.28	0.00	0.00	0.28	1.33	0.22	0.68	0.00	0.00	0.00	0.79	0.81	0.50	0.00	0.57	0.00
Kolbesia amoena	AC156A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kolbesia nitidiformis	AC196A	0.00	0.00	0.00	0.00	0.00	0.00	0.89	0.28	0.27	0.00	0.00	0.00	0.00	0.46	0.00	0.00	0.25	0.23	0.29	0.00
Kolbesia suchlandtii	AC034A	0.00	0.00	0.00	0.00	0.00	0.62	0.00	0.28	0.80	1.34	0.23	0.00	0.52	0.69	0.26	0.00	0.50	1.38	0.29	0.24
Luticola mutica	NA025A	0.00	0.87	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
Mayamaea atomus	NA084A	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	0.50	0.00	0.00	0.00
Meridion circulare	MR001A	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	0.00	0.00	0.29	0.00
Navicula cincta	NA021A	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	0.73
Navicula cryptocephala	NA007A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00
Navicula cryptotenella	NA751A	0.00	1.16	1.20	0.23	0.57	0.00	0.89	0.85	0.80	1.12	1.13	0.99	0.52	0.23	0.53	1.08	1.25	1.38	1.44	1.21
Navicula lanceolata	NA009B	0.00	0.29	0.30	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 lenzii	NA761A	0.00	0.00	0.00	0.00	0.00	0.31	0.30	0.28	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
Navicula leptostriata	NA156A	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	0.73
Navicula menisculus	NA030A	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

% data									Depth	(cm)											
Full Name	**Code**	**0**	**1**	**2**	**3**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**24**	**26**	**28**	**32**	**34**	**36**	**38**
Navicula modica	NA123A	0.00	0.00	0.00	0.00	0.00	0.00	0.30	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 porifera var. opportuna	NA577B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.74	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula radiosa	NA003A	0.00	0.29	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 recens	NA762A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	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 reichardtiana	NA768A	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
Navicula rhyncocephala	NA008A	0.30	0.29	0.00	0.00	0.00	0.00	0.00	0.28	1.07	0.22	0.23	0.99	0.26	0.00	0.00	0.54	0.25	0.00	0.57	0.00
Navicula sp.	NA9999	0.60	0.29	0.30	0.93	1.14	0.62	0.59	0.56	0.27	0.89	1.35	0.99	0.79	0.69	1.05	1.08	0.75	0.23	1.15	0.73
Navicula submuralis	NA166A	0.60	0.87	3.00	3.94	3.70	2.78	5.04	2.82	1.87	2.68	2.03	1.48	1.84	4.62	3.95	1.62	1.75	1.61	2.30	0.73
Navicula subrotundata	NA114A	0.00	0.00	0.00	0.00	0.28	1.23	2.08	0.28	0.80	0.00	0.68	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.73
Navicula veneta	NA054A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Naviculadicta parabryophila	NA045A	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
Nedium spp	NE9999	0.00	0.00	0.00	0.00	0.28	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
Neidium alpinum	NE006A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Neidium septentrionale	NE014A	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	0.23	0.00	0.00
Nitzschia amphibia	NI014B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.29	0.24
Nitzschia angustata	NI020A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.29	0.00
Nitzschia capitellata	NI028A	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	0.29	0.00
Nitzschia dissipata	NI015A	0.00	0.00	0.30	0.23	0.00	0.00	0.00	0.28	0.00	0.00	0.00	1.23	0.00	0.00	0.00	0.00	0.25	0.23	0.86	0.00
Nitzschia fonticola	NI002A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.25	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitzschia frustulum	NI008A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.45	0.00	0.49	0.00	0.46	0.79	0.00	0.50	0.00	0.00	0.00
Nitzschia inconspicua	NI043A	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	0.27	0.00	0.00	0.00	0.00
Nitzschia palea	NI009A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.73
Nitzschia spp	NI9999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.53	0.00	0.23	0.00	0.26	0.00	0.00	0.00	0.25	0.23	0.57	0.48
Pinnularia microstauron	PI011A	0.00	0.00	0.00	0.23	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
Pinnularia spp	PI9999	0.00	0.00	0.30	0.00	0.28	0.00	0.30	0.00	0.27	0.89	0.00	0.00	0.26	0.00	0.53	0.54	0.00	0.23	0.86	0.48
Placoneis clementioides	NA281A	0.00	0.00	0.00	0.00	0.28	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
Placoneis explanata	NA100A	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	0.25	0.00	0.00	0.00
Placoneis opportuna	NA109A	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	0.69	0.00	0.54	0.25	0.00	0.00	0.00
Planothidium oestrupii	AC007A	0.00	0.00	0.00	0.23	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.26	0.00	0.26	1.35	1.00	0.00	0.00	0.73
Planothidium calcar	AC005A	0.90	0.00	1.50	0.23	2.56	1.23	2.08	1.41	2.93	0.89	0.00	0.49	0.00	0.69	1.05	1.08	0.00	0.69	1.44	0.00
Planothidium frequentissimum	AC001R	0.00	3.19	3.00	1.86	3.70	4.32	3.26	0.85	2.13	0.45	0.45	0.74	0.26	0.92	2.11	0.54	0.75	0.23	0.29	0.73
Planothidium joursacense	AC170A	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	0.54	1.50	0.00	0.00	0.00
Planothidium peragalli	AC011A	0.00	0.00	0.30	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00
Planothidium rostratum	AC001B	0.00	0.00	0.30	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
Psammothidium altaicum	AC046A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24
Psammothidium helveticum	AC134A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.26	0.23	0.00	0.27	0.00	0.00	0.00	0.00
Psammothidium marginulatum	AC022A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.00	0.25	0.23	0.29	0.24
Psammothidium curtissimum	AC060A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.45	0.00	0.00	0.00	0.00	0.00	0.25	0.69	0.00	0.00
Psammothidium holsaticum	AC177A	0.00	0.00	0.30	0.00	0.00	0.62	0.00	0.28	0.27	0.00	0.00	0.00	0.00	0.00	0.79	0.00	0.00	0.00	0.00	0.00

% data									Depth	(cm)											
Full Name	**Code**	**0**	**1**	**2**	**3**	**4**	**6**	**8**	**10**	**12**	**14**	**16**	**18**	**20**	**24**	**26**	**28**	**32**	**34**	**36**	**38**
Psammothidium levanderi	AC044A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.45	0.00	0.00	0.26	0.23	0.00	0.54	0.25	0.23	0.00	0.00
Psammothidium sacculum	AC119A	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	0.48
Psammothidium semiapertum	AC120A	0.00	0.00	0.00	0.00	0.00	0.31	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
Psammothidium subatomoides	AC136A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.79	0.23	0.26	0.00	0.00	0.00	0.00	0.00
Pseudostaurosira robusta	FR063A	0.00	0.00	0.00	0.46	0.28	0.31	0.89	2.54	1.33	0.89	0.23	1.48	1.57	0.00	1.05	0.00	0.50	0.00	1.15	0.73
Pseudostaurosira brevistriata	FR006A	1.81	0.58	4.50	3.48	3.99	3.40	2.97	3.10	3.73	3.35	3.60	3.46	3.94	4.85	4.47	5.95	3.25	6.22	1.72	4.84
Pseudostaurosira pseudoconstruens	FR056A	0.00	0.87	1.20	1.39	1.71	1.23	2.97	0.00	0.27	0.45	0.68	2.72	1.84	0.23	1.05	1.62	1.25	1.38	0.29	2.42
Reimeria sinuata	RE001A	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.27	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rhopalodia gibba	RH001A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rossithidium pusillum	AC035A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.23	0.25	0.52	0.46	0.26	0.27	0.00	0.00	0.00	0.24
Sellaphora laevissima	NA102A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.25	0.69	0.86	0.00
Sellaphora pupula	NA014A	0.30	0.58	0.30	0.00	0.00	0.31	0.30	0.00	0.27	0.22	0.00	0.00	0.00	0.23	0.26	0.00	0.25	0.69	0.00	0.00
Sellaphora seminulum	NA005A	0.00	0.00	0.00	0.46	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.23	0.29	0.24
Sellaphora vitabunda	NA168A	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
Stauroneis anceps	SA001A	0.60	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
Stauroneis smithii	SA003A	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	0.26	0.00	0.00	0.00	0.00	0.00
Stauroneis spp	SA9999	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.29	0.00
Stauroneis undulata	SA070A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.25	0.00	0.00	0.26	0.00	0.00	0.23	0.29	0.00
Staurosira binodis	FR002B	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	0.79	0.00	0.00	0.00	0.00	0.00
Staurosira construens	FR002A	0.00	0.29	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.26	0.00	0.00	0.00	0.86	0.00
Staurosira construens var. venter	FR002C	1.20	4.06	3.60	2.09	2.56	2.16	0.30	1.69	3.20	1.12	0.45	0.99	1.31	0.46	2.11	0.81	2.00	1.15	1.15	4.84
Staurosira lapponica	FR011A	0.60	0.58	0.00	0.46	0.85	0.00	0.30	0.28	0.80	0.22	0.45	0.25	0.26	0.00	0.53	0.81	0.75	1.15	0.86	0.73
Staurosira microstriata	FR062A	0.00	0.00	0.00	0.23	0.00	0.31	1.19	0.28	1.33	0.89	0.23	0.00	1.31	0.92	0.79	1.08	1.25	2.76	1.15	0.00
Staurosirella leptostauron	FR014A	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	0.48
Staurosirella pinnata	FR001A	1.20	2.03	6.31	5.34	6.84	8.02	6.53	7.04	2.93	5.36	3.15	5.43	4.20	6.70	10.26	9.46	6.50	7.14	9.48	5.08
Stephanodiscus medius	ST014A	3.31	5.22	2.40	0.70	1.71	1.85	2.08	1.41	1.33	0.89	1.35	1.73	1.31	0.46	1.32	0.54	0.75	0.00	1.15	1.69
Stephanodiscus parvus	ST010A	2.41	1.74	0.60	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
Surirella brebisonii	SU073A	0.00	0.00	0.00	0.00	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	0.00	0.00
Surirella spp	SU9999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.22	0.23	0.25	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00
Synedra nana	SY009A	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	0.00	0.00
Synedra parasitica	FR045A	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	0.48
Synedra pulchella var. subconstricta	SY008D	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00
Synedra tenera	SY013A	1.51	1.16	0.30	1.86	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
Synedra ulna	SY001A	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tabellaria flocculosa (long)	TA001A	4.82	0.87	2.70	3.48	0.85	0.93	0.00	0.28	0.00	0.45	0.68	0.00	0.52	0.00	0.00	0.81	0.25	0.23	0.00	0.00
Tabellaria flocculosa (short)	TA9997	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.28	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.00

Diatom data for the Gjersjøen core (% relative abundance)

% data		Depth (cm)																			
Full Name	**Code**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**9**	**11**	**13**	**15**	**17**	**19**	**24**	**28**	**32**	**36**	**40**	**44**
Achnanthes exigua	AC008A	1.00	0.33	0.67	0.00	0.00	0.33	0.33	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.33	0.33
Achnanthes lapponica	AC038A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Achnanthes sp.	AC9999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.33	0.00
Achnanthidium minutissimum	AC013A	8.33	11.04	3.67	5.25	3.70	3.65	11.00	11.37	16.39	3.00	3.02	22.00	15.28	1.34	5.33	6.89	6.33	4.00	16.33	3.99
Amphora coffeaeformis	AM006A	0.33	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.00	0.00	0.00	0.00	0.66	0.67	0.00	0.00	0.00	0.00	0.00	0.00
Amphora ovalis	AM001A	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.33	0.00
Amphora pediculus	AM012B	0.00	0.00	0.33	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	0.33	0.33	0.00
Asterionella formosa	AS001A	3.67	13.71	5.33	0.98	3.03	5.98	17.33	0.33	0.00	0.00	1.01	1.00	0.33	0.67	1.33	0.00	0.00	0.00	0.67	0.66
Aulacoseira ambigua	AU002A	0.67	1.00	0.00	0.00	0.67	0.33	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	0.33
Aulacoseira distans	AU005A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	1.01	0.67	0.66	0.33	12.67	3.93	2.00	0.67	0.67	0.00
Aulacoseira spp	AU9999	0.00	0.00	0.67	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 subborealis	AU022A	0.33	0.00	0.00	1.31	1.68	8.97	14.33	9.36	6.69	5.00	34.90	18.33	19.27	25.75	30.00	34.10	32.33	32.33	19.00	25.58
Brachysira brebissonii	BR006A	0.00	0.00	0.00	0.00	0.00	0.33	0.00	1.00	0.00	1.00	1.01	0.67	0.00	1.00	0.33	0.33	0.67	0.33	0.33	0.00
Brachysira vitrea	BR001A	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	0.67	0.00
Brachysira vitrea var. lanceolata	BR001B	0.33	0.67	0.33	0.98	1.35	0.00	1.67	1.67	5.02	6.00	5.70	5.67	5.32	1.67	0.00	1.97	2.33	2.67	5.67	1.99
Caloneis sp.	CA9999	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	0.33
Cavinula cocconeiformis	NA032A	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	0.33	0.33	0.00	0.00	0.00
Cavinula jaernefeltii	NA002A	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	0.33	0.00	0.00	0.00	0.00	0.00
Cavinula pseudoscutiformis	NA013A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	1.00	0.34	0.00	0.33	0.33	0.33	0.00	0.00	0.00	0.33	0.00
Cocconeis diminuta	CO006A	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	0.33	0.00	0.00	0.00	0.00
Cocconeis disculus	CO010A	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	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Cocconeis placentula	CO001A	0.00	0.00	0.00	0.00	0.34	0.33	0.00	0.33	0.33	0.00	0.00	0.00	0.00	0.67	0.33	0.33	0.00	0.67	0.00	0.00
Cocconeis placentula var. euglypta	CO001B	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cyclotella atomus	CY011A	2.00	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	0.00
Cyclotella comensis	CY010A	42.00	10.37	0.67	0.00	0.00	0.33	1.33	2.34	0.00	1.00	0.00	6.00	1.99	0.67	0.00	0.00	0.00	2.33	25.33	1.66
Cyclotella kuetzingiana var. radiosa	CY006C	0.00	0.00	0.33	0.33	0.00	1.33	5.00	0.33	1.67	0.00	0.67	3.33	1.66	0.33	12.33	2.62	0.00	0.00	0.00	0.00
Cyclotella meneghiniana	CY003A	0.00	0.00	0.00	1.64	1.01	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
Cyclotella pseudostelligera	CY002A	2.00	4.68	3.00	3.61	3.03	2.33	1.67	0.00	0.67	0.00	0.67	0.67	0.66	0.33	0.00	0.00	0.00	0.00	0.33	0.00
Cyclotella radiosa	CY019A	1.67	1.67	1.00	1.97	1.35	5.98	16.67	38.46	33.44	30.00	20.47	16.67	31.23	36.45	19.00	33.44	38.33	44.00	12.67	45.51
Cyclotella stelligera	CY004A	0.00	0.00	0.00	0.00	1.35	2.99	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cymbella affinis	CM022A	0.67	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cymbella aspera	CM005A	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	0.33
Cymbella lunatum	CM048A	0.00	0.33	0.00	0.00	0.00	0.00	0.33	0.00	0.00	1.00	0.67	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cymbella naviculiformis	CM009A	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	0.33

% data		Depth (cm)																			
Full Name	**Code**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**9**	**11**	**13**	**15**	**17**	**19**	**24**	**28**	**32**	**36**	**40**	**44**
Cymbella sp.	CM9999	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	1.00
Denticula tenuis	DE001A	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	1.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Diatoma tenue var. elongatum	DT004B	2.67	10.03	8.67	9.51	10.77	2.99	0.00	0.33	0.33	1.00	0.67	0.00	0.66	0.00	0.00	0.00	0.00	0.00	0.33	0.33
Diatoma vulgare	DT003A	0.33	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	0.00	0.00	0.00
Diploneis oblongella	DP007A	0.00	0.00	0.00	0.33	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 ovalis	DP001A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00
Encyonema minutum	CM031A	0.67	0.67	1.00	1.64	1.68	0.33	1.33	1.34	1.67	0.00	0.34	0.67	1.00	1.34	2.00	0.00	0.67	1.00	0.00	1.00
Encyonema turgidum	CM002A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.66
Encyonopsis cesatii	CM015A	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.00	0.00	0.00	0.00	0.66	0.67	0.00	0.00	0.00	0.33	0.00	0.00
Encyonopsis microcephala	CM004A	0.67	0.33	0.00	0.00	0.67	0.33	0.00	0.00	0.33	0.00	0.00	1.67	0.33	0.33	0.00	0.00	0.00	0.33	0.67	0.66
Eucocconeis flexella	AC025A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.34	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Eunotia arcus	EU013A	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	0.33	0.33	0.00	0.00	0.00	0.00	0.00
Eunotia curvata	EU049A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	1.00	0.00	0.66
Eunotia incisa	EU047A	0.00	0.00	0.33	0.00	0.00	0.00	0.00	1.00	0.33	1.00	0.00	0.67	0.00	1.00	0.33	0.00	1.33	0.33	0.00	1.00
Eunotia meisteri	EU020A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eunotia pectinalis	EU002A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eunotia pectinalis var. minor	EU002B	0.00	0.00	0.00	0.00	0.00	0.66	0.00	0.33	0.00	1.00	0.34	0.00	0.33	1.34	0.00	0.00	0.00	0.00	0.00	0.66
Eunotia praerupta	EU003A	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.67	0.33	0.00	0.00	0.00	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Eunotia praerupta var. inflata	EU003B	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	0.33	0.00	0.00	0.00
Eunotia sp.	EU9999	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.00	2.00	0.00	0.33	0.00	0.00	0.00	0.66	0.33	0.33	0.67	0.33
Eunotia valida	EU029A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fallacia pygmaea	NA010A	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	0.33	0.00
Fragilaria capucina	FR009A	0.67	0.67	1.00	1.31	0.34	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 capucina var. gracilis	FR009H	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.33	0.00	0.33	1.33	0.00
Fragilaria capucina var. mesolepta	FR009B	2.33	0.33	0.00	0.00	0.67	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 crotonensis	FR008A	3.67	1.34	25.67	52.46	37.04	37.21	0.33	3.01	2.01	2.00	5.03	0.00	1.33	3.34	0.00	0.00	0.00	0.00	0.00	0.00
Fragilaria vaucheriae	FR007A	1.33	0.33	0.00	0.33	0.67	0.66	0.33	0.00	2.34	2.00	0.00	2.00	1.00	1.00	1.00	1.31	2.00	0.00	0.00	0.33
Fragilariforma virescens	FR005A	0.00	0.33	0.33	0.98	1.68	1.99	2.33	4.68	5.02	6.00	2.01	1.00	1.00	1.00	2.33	0.33	0.33	0.33	2.00	0.66
Frustulia rhomboides	FU002A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.33	0.00	0.00
Frustulia rhomboides var. saxonica	FU002B	0.00	0.00	0.00	0.00	0.00	0.33	0.67	0.00	0.67	1.00	1.01	0.00	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gomphoneis olivaceum	GO001A	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	0.33
Gomphonema acuminatum	GO006A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	1.00	0.00	0.34	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.33
Gomphonema acuminatum var. coronatum	GO006C	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.33	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gomphonema acuminatum var. trigonocephalum	GO006B	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	0.33	0.00	0.00
Gomphonema angustatum	GO003A	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.67	0.33	0.00	1.00
Gomphonema gracile	GO004A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	2.00	0.34	0.33	0.33	0.00	0.00	0.33	0.00	0.33	0.00	0.66

% data		Depth (cm)																			
Full Name	**Code**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**9**	**11**	**13**	**15**	**17**	**19**	**24**	**28**	**32**	**36**	**40**	**44**
Gomphonema lanceolatum	GO017A	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	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Gomphonema longiceps	GO018A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gomphonema parvulum	GO013A	0.00	0.33	0.00	0.00	0.00	0.00	0.33	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.67	0.33	0.33	0.00	0.33	0.00
Gomphonema spp	GO9999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	2.00	0.00	0.33	0.33	0.00	0.00	0.66	0.33	0.33	0.00	0.00
Gomphonema truncatum	GO023A	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.00	0.00	0.33	0.33	0.00
Gomphonema vibrio var. intricatum	GO025B	0.67	0.00	0.00	0.00	0.00	0.00	0.00	1.67	1.00	0.00	1.01	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.33	0.00
Gyrosigma acuminatum	GY005A	0.00	0.00	0.33	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00
Hannaea arcus	HN001A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.33	0.00	0.00	0.67	0.00
Hippodonta hungarica	NA004A	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.00	1.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Karayevia clevei	AC006A	0.33	0.33	0.33	1.31	2.02	2.66	2.33	1.00	0.33	0.00	0.34	0.00	0.33	0.67	0.00	0.00	0.00	0.00	0.00	0.00
Luticola mutica	NA025A	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	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Martyana martyi	FR065A	0.00	0.00	1.00	0.00	0.00	0.66	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Meridion circulare	MR001A	0.00	0.33	0.33	0.00	0.00	0.33	0.67	0.00	0.67	0.00	0.67	0.33	0.66	0.33	0.00	0.66	0.33	0.33	1.00	1.33
Navicula cryptocephala	NA007A	0.00	0.00	0.33	0.00	0.34	0.00	1.00	0.00	0.67	1.00	0.34	0.33	0.33	0.00	0.33	0.66	0.00	0.00	0.67	0.66
Navicula oblonga	NA539A	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	0.33	0.00	0.00	0.00
Navicula radiosa	NA003A	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.67	0.00	0.00	0.00
Navicula sp.	NA9999	0.00	0.00	0.00	0.00	0.67	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.33	0.00	0.00	1.67	0.00	0.33	0.00
Navicula veneta	NA054A	0.33	0.67	0.00	0.00	0.34	0.33	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 viridula	NA027A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	2.01	4.00	0.34	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33
Neidium affine var. amphirynchus	NE003C	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	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 denticula	NI003A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	1.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitzschia dissipata	NI015A	0.00	0.00	0.00	0.33	0.34	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 frustulum	NI008A	0.00	1.34	1.00	0.98	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.33	0.33	0.67	0.00	0.00	0.33
Nitzschia palea	NI009A	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.34	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00
Nitzschia recta	NI025A	0.00	0.00	0.00	0.33	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.33
Nitzschia sinuata var. tabellaria	NI164C	0.33	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
Nitzschia spp	NI9999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Parlibellus crucicula	NA067A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.33	0.00	0.00
Pinnularia borealis	PI012A	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	0.33	0.00
Pinnularia hemiptera	PI003A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pinnularia sp.	PI9999	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.01	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pinnularia subcapitata	PI022A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	1.00	0.34	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Placoneis exigua	NA011A	0.00	0.00	0.67	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
Planothidium lanceolata	AC001A	0.33	0.00	0.33	0.33	0.67	1.00	0.67	0.67	0.00	1.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.33
Planothidium oestrupii	AC007A	0.00	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00
Planothidium peragalli	AC011A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.33	0.00	0.00	0.00

% data		Depth (cm)																			
Full Name	**Code**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**9**	**11**	**13**	**15**	**17**	**19**	**24**	**28**	**32**	**36**	**40**	**44**
Pseudostaurosira brevistriata	FR006A	0.33	0.33	0.33	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.34	0.33	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.33
Reimeria sinuata	RE001A	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.67	0.00	0.00	0.33	0.00	0.00	0.33
Rhoicosphenia abbreviata	RC002A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rossithidium linearis	AC002A	1.33	1.00	2.00	0.98	0.00	0.66	3.00	2.01	1.67	0.00	0.34	4.00	2.33	0.00	2.67	0.66	2.33	1.00	1.00	0.66
Sellaphora pupula	NA014A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sellaphora pupula var. elliptica?	NA014F	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	0.33	0.00	0.00	0.00
Sellaphora pupula var. rectangularis?	NA014B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.67	0.00	0.00	0.67	0.00	0.33	0.00	0.00	0.00
Stauroneis parvula	SA002A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stauroneis smithii	SA003A	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.33	0.33	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stauroneis sp.	SA9999	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	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Staurosira binodis	FR002B	1.67	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Staurosira construens	FR002A	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	0.00	0.00	0.34	1.00	0.33	0.33	0.00	0.00	0.33	0.33	0.33	0.00
Staurosira construens var. venter	FR002C	1.33	1.00	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	0.33	0.00
Staurosirella leptostauron	FR014A	0.00	0.00	0.00	0.00	0.00	0.33	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
Staurosirella pinnata	FR001A	0.33	1.00	2.00	0.98	0.00	0.33	1.33	2.34	2.01	1.00	0.00	0.33	2.66	0.67	0.33	0.00	0.67	0.00	0.67	0.00
Stephanodiscus alpinus	ST009A	1.67	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Stephanodiscus hantzschii	ST001A	0.00	4.01	0.33	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
Stephanodiscus parvus	ST010A	3.67	1.67	2.67	1.97	0.00	0.00	0.00	0.33	1.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Surirella gracilis	SU9999	0.00	0.00	0.00	0.00	0.00	0.33	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
Surirella ovata	SU002A	0.33	0.00	0.00	0.00	0.00	0.33	0.67	0.33	0.33	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00
Surirella ovata var. pinnata	SU002B	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	0.33	0.00	0.00	0.00
Synedra acus var. radians	SY003B	9.00	25.75	32.67	3.61	16.50	6.31	0.00	0.67	0.00	0.00	1.01	0.33	0.33	0.00	0.00	0.66	0.00	0.33	1.00	1.00
Synedra parasitica	SY004A	0.00	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.33	0.00
Synedra parasitica var. subconstricta	SY004B	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Synedra rumpens	SY002A	1.00	0.00	0.00	0.00	0.00	0.00	1.33	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
Synedra rumpens var. familiaris	SY002B	0.00	1.67	0.67	4.59	4.71	2.33	0.00	0.00	0.33	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Synedra ulna	SY001A	0.00	0.00	0.00	0.00	0.00	1.33	0.00	0.00	0.00	1.00	0.00	0.33	0.00	0.33	0.00	0.00	0.00	0.67	0.67	0.33
Synedra ulna var. danica	SY001C	0.33	0.67	0.00	0.33	1.35	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
Tabellaria fenestrata	TA002A	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.67	1.00	0.00	1.00	0.33	1.34	0.33	0.33	0.00	0.00	0.00	0.00
Tabellaria flocculosa (long)	TA001A	0.00	0.00	0.00	0.00	0.34	2.33	5.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	5.90	0.00	0.00	0.00	0.00
Tabellaria flocculosa (short)	TA997A	0.00	0.33	0.33	0.98	0.67	0.66	2.00	1.67	3.01	11.00	9.06	4.33	4.98	9.03	2.67	1.97	1.67	2.67	1.33	3.32
Tatracyclus lacustris	TE001A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tryblionella angustata	NI020A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Diatom data for the Lyseren core (% relative abundance)

% data		Depth (cm)																			
Full Name	**Code**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**26**	**28**	**30**
Achnanthidium gracillimum (fine)	AC072A	0.92	0.63	1.27	1.27	2.51	1.97	4.33	3.04	2.65	2.92	1.60	1.20	0.63	0.98	0.30	0.00	0.30	0.29	0.98	0.62
Achnanthidium microcephalum	AC003A	0.00	0.00	0.00	0.00	0.00	0.66	0.33	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
Achnanthidium minutissimum	AC013A	3.38	8.54	8.54	5.41	6.58	8.22	10.00	12.77	15.89	15.26	13.46	5.69	8.23	5.86	6.80	6.84	2.08	7.25	5.86	4.33
Adlafia bryophila	NA045A	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	0.33	0.00
Adlafia minuscula	NA112A	0.00	0.00	0.63	0.00	0.63	0.00	0.00	0.00	0.00	0.65	0.64	0.00	0.63	0.00	0.30	0.65	0.30	0.29	0.65	0.31
Amphora fogediana	AM010A	0.00	0.00	0.00	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
Amphora inariensis	AM013A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.00
Amphora libyca	AM011A	0.31	0.00	0.32	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Amphora ovalis	AM001A	0.00	0.00	0.00	0.00	0.31	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
Amphora thumensis	AM008A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asterionella formosa	AS001A	4.31	7.28	14.56	28.66	11.29	11.84	7.67	4.86	7.95	3.90	4.81	5.69	6.01	16.29	9.76	11.73	6.55	9.28	4.89	8.36
Aulacoseira ambigua	AU002A	3.08	0.63	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 distans	AU005A	0.62	0.63	1.27	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.32	0.98	0.89	1.95	0.60	0.00	1.63	2.17
Brachysira brebissonii	BR006A	0.00	0.00	0.00	0.32	0.00	0.00	1.00	0.30	0.00	0.00	0.00	0.60	0.00	0.65	1.48	0.33	0.00	0.00	0.65	0.93
Brachysira styriaca	BR004A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.32	0.30	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.31
Brachysira vitrea	BR001A	0.31	0.63	0.95	1.91	1.88	3.29	4.00	5.17	3.64	2.27	1.60	2.40	1.27	3.58	1.78	0.98	1.19	0.87	3.58	0.93
Caloneis bacillum	CA002A	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.33	0.31
Caloneis silicula	CA003A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Caloneis tenuis	CA018A	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	0.98	0.00
Cavinula cocconeiformis	NA032A	0.31	0.95	0.32	0.32	0.63	0.66	1.00	0.00	0.00	0.00	0.00	0.30	0.63	0.65	0.59	0.33	0.00	0.00	0.00	0.62
Cavinula pseudoscutiformis	NA013A	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	0.30	0.00	0.00	0.00	0.98	0.00
Chamaepinnularia mediocris	NA006A	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.65	0.00	0.00	0.00	0.65	0.30	0.65	0.89	0.87	0.65	0.93
Chamaepinnularia soehrensis	NA048A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cocconeis neothumensis	CO067A	0.31	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
Cocconeis placentula var. euglypta	CO001B	0.00	0.00	0.32	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
Craticula molestiformis	NA124A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.30	0.00	0.00	0.30	0.00	0.00	0.00	0.33	0.00
Cyclotella atomus	CY011A	0.00	0.00	0.00	0.00	4.08	2.96	5.00	8.81	1.32	0.65	0.64	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cyclotella comensis	CY010A	5.85	2.22	0.63	4.14	11.91	9.21	9.67	10.03	4.64	1.62	0.64	2.10	1.90	1.95	0.59	0.98	43.45	3.48	1.30	0.62
Cyclotella distinguenda var. unipunctata	CY028B	1.85	1.58	0.95	1.59	2.82	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Cyclotella ocellata	CY009A	0.00	1.58	3.16	2.55	7.21	13.49	11.00	10.64	7.62	8.77	3.53	10.18	14.56	12.05	13.31	11.73	7.44	6.09	8.47	8.67
Cyclotella pseudostelligera	CY002A	2.46	9.81	10.76	3.50	1.25	0.33	1.33	2.13	8.28	2.27	18.27	4.19	3.16	0.33	0.00	1.95	1.49	10.14	0.00	0.00
Cyclotella radiosa	CY019A	11.69	4.75	4.43	4.46	1.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00
Cyclotella rossii	CY052A	6.77	10.44	11.39	18.15	22.88	19.08	18.33	16.72	10.93	25.00	9.62	19.76	13.92	8.47	13.91	14.66	8.63	10.72	13.03	17.65
Cymbella hebridica	CM017A	0.31	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.00

% data		Depth (cm)																			
Full Name	**Code**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**26**	**28**	**30**
Denticula tenuis	DE001A	0.00	0.32	0.00	0.32	0.00	0.00	0.00	0.61	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	DP065A	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	0.33	0.62
Diploneis sp.	DP9999	0.00	0.00	0.00	0.00	0.31	0.66	0.33	0.00	0.00	0.32	0.00	0.00	0.63	0.65	0.30	0.00	0.30	0.00	0.33	0.00
Encyonema gaeumanii	CM020A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	1.30	0.64	1.20	0.32	0.33	0.30	0.00	0.60	1.16	0.33	0.62
Encyonema gracile	CM018A	0.00	0.00	0.32	0.00	0.31	0.33	2.33	0.30	0.66	0.97	0.64	0.60	0.32	0.33	1.48	0.98	0.60	0.00	0.33	0.93
Encyonema minutum	CM031A	0.00	0.00	0.32	0.64	0.00	0.00	0.00	0.00	0.33	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Encyonema silesiacum	CM103A	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.30	0.33	0.65	0.00	0.00	0.32	0.00	0.00	0.00	0.30	0.29	0.33	0.00
Encyonopsis cesatii	CM015A	0.00	0.00	0.00	0.00	0.63	0.33	1.33	0.61	0.99	0.32	0.00	0.30	0.32	0.33	0.59	0.65	0.30	0.29	0.98	0.62
Encyonopsis failaisensis	CM049A	0.00	0.00	0.00	0.64	0.63	0.99	0.33	0.91	2.32	0.97	2.24	2.10	1.27	1.30	0.89	0.33	0.30	1.16	1.30	0.93
Eolimna minima	NA042A	0.62	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.62
Eolimna subadnata	NA174A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.65	0.30	0.65	0.00	0.00	1.30	0.31
Eucocconeis laevis	AC083A	0.00	0.32	0.00	0.00	0.31	0.00	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00
Eunotia curvata	EU049A	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.91	0.33	0.32	0.00	0.30	0.32	0.00	0.30	0.00	0.00	0.29	0.33	0.31
Eunotia exigua	EU009A	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.66	0.00	0.00	0.00	0.00	0.00	0.30	0.33	0.00	0.00	0.00	0.00
Eunotia flexuosa	EU017A	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	0.30	0.00	0.00	0.31
Eunotia implicata	EU107A	0.00	0.00	0.00	0.00	0.00	0.00	0.33	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
Eunotia incisa	EU047A	0.92	0.00	0.00	0.32	0.00	0.00	0.33	0.00	0.00	0.00	0.32	0.00	0.32	0.00	0.00	0.33	0.30	0.58	0.33	0.31
Eunotia minor	EU110A	0.62	0.32	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.65	0.00	0.60	0.63	0.65	0.00	0.00	0.00	0.29	0.65	0.62
Eunotia naegelii	EU048A	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.33	0.00
Eunotia rhyncocephela	EU106A	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	0.33	0.00
Fragilaria capucina var. capucina	FR009A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fragilaria crotonensis	FR008A	9.85	7.59	3.48	0.96	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 vaucheriae	FR007A	0.00	0.00	0.00	0.32	1.25	0.00	0.00	0.30	0.66	0.00	0.00	0.30	0.63	0.33	0.00	0.65	0.00	0.29	0.65	0.62
Fragilariforma exigua	FR064A	0.00	0.00	0.32	0.32	1.25	0.66	0.33	0.61	0.66	0.32	0.32	0.90	0.95	0.98	1.78	0.65	0.60	1.16	4.56	2.79
Fragilariforma virescens	FR005A	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.33	0.00	0.29	0.00	0.00
Frustulia rhomboides var. saxonica	FU002B	0.00	0.00	0.00	0.32	0.31	0.00	1.33	0.30	0.66	0.65	0.00	0.60	0.32	0.00	0.00	0.65	0.00	0.29	0.33	0.62
Geissleria ignota var. acceptata	NA433D	0.00	0.00	0.00	0.00	0.63	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
Geissleria kriegeri	NA466A	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	0.65	0.00	0.00	0.00	0.00	0.00	0.00
Gomphonema angustatum	GO003A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Gomphonema gracile	GO004A	0.31	1.27	0.00	0.32	0.00	0.00	0.33	0.00	0.00	0.32	0.00	0.30	0.95	0.00	0.00	0.33	0.30	0.00	0.00	0.00
Gomphonema parvulum	GO013A	0.31	0.32	0.95	0.00	0.31	0.33	0.00	0.00	0.66	0.00	0.64	0.90	0.00	0.00	0.59	0.33	0.00	0.00	0.98	0.00
Gomphonema pumilum	GO080A	0.00	0.00	0.32	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
Gomphonema truncatum	GO023A	0.00	0.32	0.32	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
Hippodonta subcostulata	NA053A	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	1.30	0.31
Karayevia clevei	AC006A	0.00	0.00	0.00	0.00	0.31	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
Karayevia laterostrata	AC018A	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.65	0.00

% data		Depth (cm)																			
Full Name	**Code**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**26**	**28**	**30**
Kolbesia amoena	AC156A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.65	0.31
Kolbesia ploenensis	AC049A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Kolbesia suchlandtii	AC034A	0.00	0.00	0.00	0.32	0.31	0.33	0.00	1.82	1.32	0.32	0.00	0.00	0.63	0.33	0.00	0.00	0.30	0.58	0.33	1.86
Mayamaea agrestis	NA190A	0.00	0.00	0.00	0.32	0.00	0.33	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
Meridion circulare	MR001A	0.00	0.00	0.00	0.00	0.00	0.33	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 angusta	NA037A	0.62	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 arvensis	NA038A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	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 concentrica	NA164A	0.00	0.00	0.00	0.00	0.00	0.00	0.67	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 cryptocephala	NA007A	0.00	0.00	0.32	0.64	0.31	0.00	0.00	0.61	0.99	0.32	1.60	0.00	1.27	0.00	2.07	1.30	0.30	1.74	2.61	1.55
Navicula cryptotenella	NA751A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.32	0.64	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula difficillima	NA115A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.62
Navicula festiva	NA039A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Navicula hustedtii	NA429A	0.00	0.00	0.00	0.00	0.00	0.33	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 insociabilis	NA452A	0.00	0.95	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 obsoleta	NA737A	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.66	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.65	0.00
Navicula oculata	NA545A	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	0.30	0.00	0.00	0.00	0.00	0.00
Navicula praeterita	NA578A	0.00	0.32	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 radiosa var. radiosa	NA003A	0.92	0.32	0.32	0.00	0.31	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.89	0.65	0.30	0.29	0.00	0.31
Navicula rhyncocephala	NA008A	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	0.31
Navicula sp 1 Unknown	NA9999	0.00	0.63	0.00	0.64	1.25	1.32	0.67	0.91	0.33	0.32	0.32	0.00	0.32	1.63	0.59	1.30	0.89	0.58	0.65	1.55
Navicula submuralis	NA166A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.65	0.59	0.00	0.30	0.00	0.00	0.00
Navicula utermoehlii	NA144A	0.31	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 veneta	NA054A	0.00	0.00	0.00	0.00	0.00	0.33	0.67	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
Naviculadicta digitulus	NA149A	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	0.65	0.31
Neidium affine	NE003A	0.00	0.32	0.32	0.00	0.31	0.00	0.33	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
Neidium bisulcatum var. bisulcatum	NE004A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00
Neidium productum	NE002A	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	0.33	0.00	0.00	0.00	0.00
Nitzschia amphibia	NI014A	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	0.30	0.00	0.00	0.00
Nitzschia dissipata	NI015A	0.00	0.00	0.32	0.32	0.31	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00
Nitzschia gracilis	NI017A	0.00	0.00	0.32	0.00	0.31	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.29	0.00	0.00
Nitzschia paleaeformis	NI139A	0.62	0.32	0.00	0.32	0.63	0.66	0.00	0.00	0.00	0.97	0.64	0.30	0.32	0.33	0.89	0.65	0.30	0.58	0.33	0.31
Nitzschia parvula	NI194A	0.00	0.00	0.00	0.00	0.00	0.00	0.67	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 perminuta	NI005A	0.00	0.00	0.32	1.91	0.94	0.33	1.00	1.82	1.99	1.30	1.28	0.90	1.27	0.98	1.48	0.33	0.00	1.16	0.65	0.31
Nitzschia recta	NI025A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.31
Nitzschia tubicola	NI048A	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	0.30	0.00	0.00	0.00	0.00	0.00
Nupela impexa	AC153A	0.00	0.32	0.00	0.00	0.00	0.33	0.00	0.00	0.66	0.00	0.96	0.00	0.63	0.65	0.30	0.33	0.60	0.29	1.30	0.93

% data		Depth (cm)																			
Full Name	**Code**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**26**	**28**	**30**
Peronia fibula	PE002A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.62
Pinnularia interrupta	PI004A	0.00	0.32	0.63	0.32	0.00	0.00	0.00	0.30	0.00	0.65	0.00	0.30	0.32	0.00	0.00	0.33	0.00	0.00	0.00	0.31
Pinnularia microstauron	PI011A	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	0.30	0.00	0.00	0.00
Psammothidium bioretii	AC141A	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.33	0.00
Psammothidium daonensis	AC167A	0.00	0.00	0.00	0.00	0.94	0.99	0.33	1.82	0.00	1.30	2.24	1.20	0.95	0.65	0.89	1.63	1.79	0.58	1.95	0.93
Psammothidium didyma	AC039A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.33	0.00	0.00	0.30	1.27	0.65	0.89	0.33	0.60	0.87	0.65	0.62
Psammothidium helveticum	AC163A	0.31	0.00	0.00	0.64	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	0.31
Psammothidium levanderi	AC044A	0.00	1.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.32	0.30	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00
Psammothidium rossii	AC116A	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	0.58	0.00	0.00
Psammothidium sacculum	AC119A	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	0.33	0.00
Psammothidium subatomoides	AC136A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.60	0.32	0.98	0.89	0.33	0.30	1.16	0.00	1.24
Psammothidium ventralis	AC161A	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	0.65	0.30	0.00	0.00	0.00
Pseudostaurosira brevistriata	FR006A	1.54	4.43	0.32	1.59	0.00	0.33	0.67	0.00	0.99	0.65	0.64	0.90	1.27	0.00	0.00	0.00	0.00	0.00	0.00	0.31
Pseudostaurosira pseudoconstruens	FR056A	0.00	3.48	2.53	0.96	0.31	1.64	2.33	0.91	2.32	1.30	2.24	1.50	1.27	1.95	0.00	1.30	0.60	0.29	1.63	1.24
Rossithidium nodosum	AC019A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.65	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rossithidium petersenii	AC105A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rossithidium pusillum	AC035A	1.54	1.58	2.53	0.96	2.19	1.97	1.67	2.13	2.32	3.25	5.77	2.69	4.11	3.58	2.96	3.91	2.98	2.32	2.28	2.17
Sellaphora bacillum	NA071A	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	0.30	0.33	0.00	0.00	0.00	0.00
Sellaphora nana	NA175A	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	0.62
Sellaphora pupula	NA014A	0.31	0.32	0.00	0.32	0.94	0.66	0.00	0.61	1.32	0.65	0.32	0.00	0.32	0.00	0.30	0.33	0.30	0.29	0.33	0.62
Stauroneis anceps	SA001A	0.00	0.32	0.00	0.32	0.00	0.33	0.00	0.30	0.00	0.00	0.64	0.00	0.95	0.98	0.59	0.00	0.00	0.00	0.65	1.55
Staurosira binodis	FR028A	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.93
Staurosira construens var. venter	FR002C	0.62	0.00	0.00	0.32	0.00	0.00	0.67	0.61	0.00	0.00	0.00	0.00	0.63	0.33	0.00	0.33	0.00	0.00	0.00	0.93
Staurosira elliptica	FR018A	0.00	0.32	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
Staurosira oldenburgiana	FR013A	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	0.65	0.31
Staurosirella pinnata	FR001A	0.31	0.00	0.63	1.27	0.31	1.97	1.00	0.00	1.32	0.32	0.32	0.30	0.63	0.98	0.30	0.33	0.60	0.00	0.98	0.31
Stenopterobia delicatissima	SP005A	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	0.33	0.00	0.00	0.00	0.00
Stenopterobia sp.	SP9999	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.31
Stephanodiscus medius	ST014A	6.46	2.22	0.00	0.32	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
Surirella angusta	SU001A	0.00	0.00	0.00	0.00	0.31	0.00	0.33	0.00	0.33	0.00	0.00	0.90	0.00	0.00	0.30	0.33	0.00	0.29	0.65	0.00
Surirella birostrata	SU014A	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	0.30	0.00	0.00	0.00	0.00	0.00
Synedra acus var. angustissima	SY003C	1.23	0.63	3.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.63	0.33	0.30	0.33	0.00	0.00	0.00	0.00
Synedra delicatissima	SY011A	0.31	0.95	0.95	0.00	0.00	0.33	0.33	0.00	0.00	0.32	0.00	0.30	0.00	0.00	0.00	0.33	0.30	0.29	0.65	0.93
Synedra parasitica var. subconstricta	SY004B	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Synedra rumpens	FR009G	1.23	0.00	0.00	0.64	0.00	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.33	0.00	0.33	0.00	0.29	0.00	0.00
Synedra tenera	FR060A	0.62	1.27	3.16	1.59	0.63	0.66	0.00	0.61	0.99	0.65	1.92	0.30	1.58	1.95	1.48	0.65	0.00	1.16	0.65	1.24

% data		Depth (cm)																			
Full Name	**Code**	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**12**	**14**	**16**	**18**	**20**	**22**	**26**	**28**	**30**
Tabellaria [flocculosa (long)]	TA9998	16.00	12.34	12.34	5.41	1.25	0.33	0.00	0.61	1.66	6.82	16.03	24.85	18.35	21.82	23.67	22.80	11.01	28.99	17.59	17.65
Tabellaria [flocculosa (short)]	TA9997	2.15	1.58	2.53	2.23	5.33	8.22	5.00	4.56	6.62	4.87	1.28	0.30	0.32	0.33	0.59	0.33	0.60	0.87	0.65	0.62
Tabellaria fenestrata	TA002A	9.54	5.06	3.16	1.59	0.63	0.33	0.00	0.00	0.00	0.65	0.64	0.60	0.95	0.33	0.30	0.00	0.00	0.29	0.00	0.31
Tetracyclus emarginatus	TE003A	0.00	0.00	0.32	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