

Sampling of Lake Müggelsee (Berlin, Germany) within the long-term ecological research programme of the IGB: Metadata description

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Study site description: Müggelsee (area 7.3 km², mean depth 4.9m, maximum depth 8.0 m) is a shallow, polymictic, and eutrophic lake lying to the southeast of Berlin, Germany. It is situated between maritime and continental climatic zones, characterized by high intra- and interannual weather variability. The lake has an average retention time of 6 – 8 weeks. Further physiographical and limnological characteristics are described by Driescher et al. (1993).

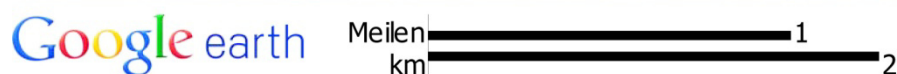
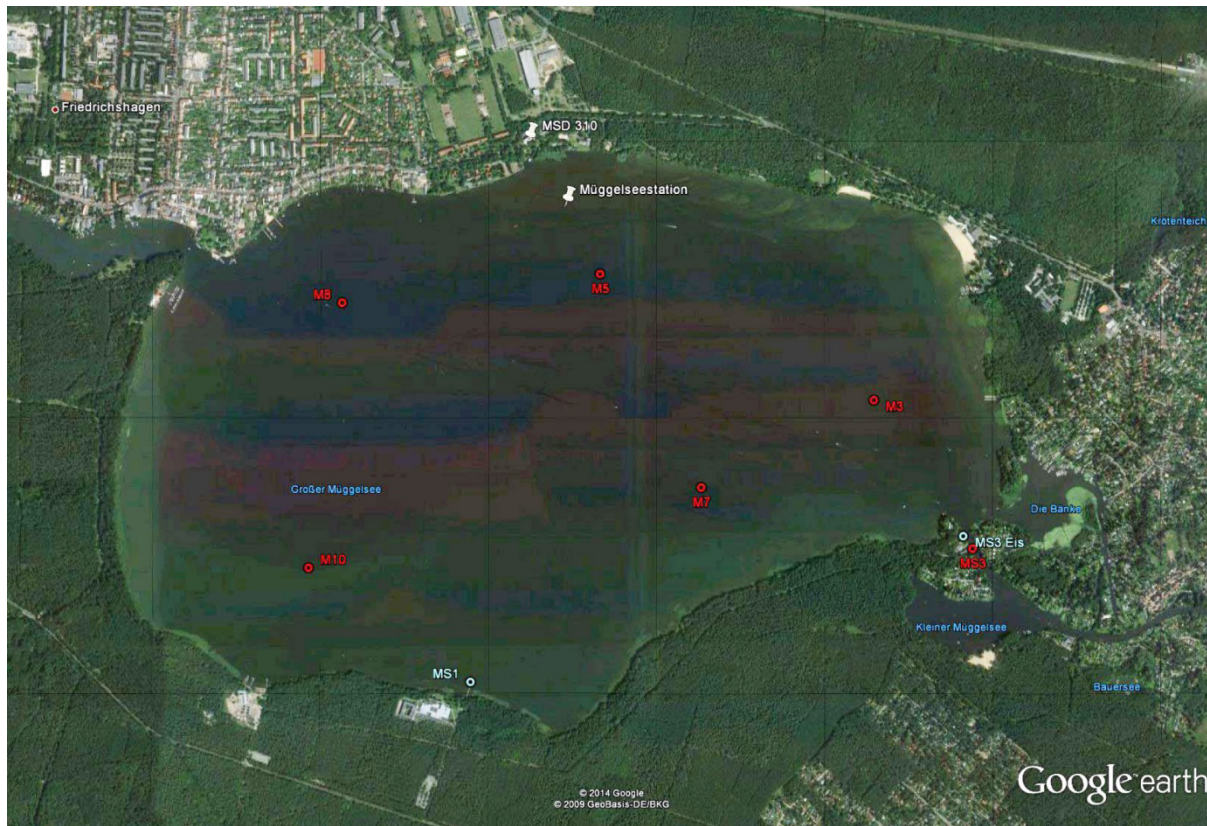


Figure 1: Google Earth Map of Lake Müggelsee: The sampling stations are depicted in red letters. Sample stations during periods of ice cover are depicted in white letters.

Lake Müggelsee is one of our prime case study sites within the long-term ecological research programme of the IGB. The lake is affected by global climate change along with a change in trophic state in the early 1990ties. The lake experienced a reduction in external nutrient loading by more than 50% in both total phosphorus (TP) and total nitrogen (TN) loading from the hypereutrophic period (19979-1990) to the eutrophic period (Köhler et al. 2005). An ice cover is usually developed during winter. However, ice cover duration has declined following a trend towards milder winters. Summer surface water temperatures increased by 0.52 °C per decade between 1976 and 2013. The lake is usually mixed during summer- but builds up thermal stratification during times of high air temperatures and calm wind conditions. The number of days, when the lake stratifies during summer has increased along with the warming trend the lake has experienced (Wagner & Adrian 2009).

Sampling protocol: The lake is sampled at weekly intervals during the growing season and at biweekly intervals during periods with ice cover. Between 1979 and 1986, phytoplankton samples were drawn weekly (in winter biweekly) at the deepest section of the lake (M7 in Table 1; integrated from 0.5, 4, and 7m). Between 1979 and 1986, zooplankton samples were sampled biweekly at the deepest point of the lake (M7, Table 1, Figure 1) at 1m intervals from the surface to the bottom. A detailed description of the sampling strategy is given in Driescher et al. (1993).

Since 1987, integrated samples were collected weekly at five different lake stations (see description below). We assume that change in the sampling strategy did not cause a significant bias in the plankton series, as analysis of synchronous zooplankton counts in 1987 (n-15) revealed no significant differences (Wilcoxon-Mann-Whitney: $p > 0.1$). Moreover, Schellenberger and Stellmacher (1986) found that seston concentrations were quasihomogeneously distributed across the lake.

Coordinates of sampling stations

(A)

Sampling stations	Coordinates North	Coordinates East
M5	52°26.610`	013°39.142`
M3	52°26.308`	013°40.217`
MS3	52°25.953`	013°40.603`
M7	52°26.099`	013°39.539`
M10	52°25.907`	013°37.967`
M8	52°26.541`	013°38.129`

(B)

Sampling stations	Coordinates North	Coordinates East
MS3 bei Eis	52°25.983`	013°40.566`
MS1 bei Eis	52°25.634`	013°38.633`

Table 1: Locations of the Müggelsee sampling stations during ice free (A) and ice covered (B) periods.

Sampling stations		M5	M3	MS3	MS3 During ice	M7	MS1 During ice	M10	M8
Epilimnion	0.5m	X		X	10l	X	30l	X	X

	1.5m	X	X	X		X		X	X
	2.5m	X				X			X
	3.5m	X				X			X
Hypo-limnion	4.5m	X				X		X	
	5.5m	X				X			
	7.0m					X/X			

Table 2: Depth specific sampling profiles at the different lake stations in Lake Müggelsee depicted by X: During thermal stratification an additional sample is taken at 7m (X) for chemical analysis.

Sampling depths at each sampling station are depicted by (X) in Table 2. At each sampling location 5 liter of lake water are sampled via a transparent Hydro Bios Universal Water Sampler (see picture Figure 2). For accuracy the sampler is lowered via a winch equipped with a depth measurement device.

Integration of samples: The integrated samples derive from samples taken at the differed sampling stations and water depths (Table 2). In Table 3 the sample integration scheme is summarized for ice free and ice covered periods, and for thermally stratified and non stratified periods. MPO stands for the upper 0-4m; MPU stand for the lower 5-7 m. Sample number in table x is for internal use only. Coordinates of the different measuring stations are depicted in table 1. During thermally un-stratified conditions all samples are integrated into one sample (MPS in Table 3). During periods of thermal stratification samples from the upper 0-4 m depths and the lower 5-7 m depth are separated. The 4m water depths basically relates to the location of the thermocline. We consider the lake thermally stratified if oxygen concentrations decline by more than 20% between 2m and 5m water depth. During periods of thermal stratification an additional sample is taken at M7 above the sediment for chemical analysis. Samples at 'MS'3 and 'MS3 Ice' are routinely taken.

Thermal regime / Ice cover		Sample acronym	Sample number	Sample stations
No ice	Thermally stratified	M7	202	M7
		MPO	206	M3, M5, M7, M8, M10
		MPU	207	M3, M5, M10
	mixed	MS3	203	MS3
Ice cover		MPS	208	M3, M5, M7, M8, M10
		MS3 Ice	204	MS3
		MS1 Ice	201	MS1

Table 3: Overview of sample description for sample taken during thermally mixed and stratified conditions and during ice free and ice covered periods. MPO: Mixed epilimnetic sample, 0-4m; MPU: mixed hypolimnetic sampl, 5-7m; MPS: sample during non-stratified conditions (mixed; 0-7m). Sample number for internal use only.

In situ measurements: Depths profiles at 0.5 -1m intervals are taken (MS3 and M7) for water temperature (°C); conductivity (µS/sec); pH; oxygen (mg/Liter and % saturation), chlorophyll *a* fluorescence (µg/Liter); depth of the measuring location using an YSI 6600 V2 4 probe.

Secchii depth: Secchii depth readings are performed at station MS3 and M7 using a 25cm diameter white Secchii disk.



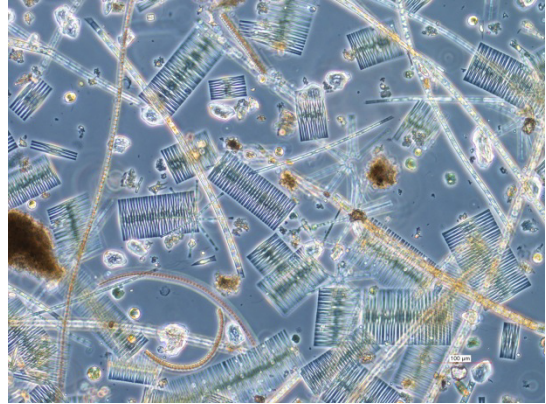
Figure 2: Hydro Bios Universal Water Sampler

References:

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Phytoplankton sample processing:

On each sampling date a non fixed concentrated water sample (concentrated through a 5 µm mesh size) is screened for actual species composition in order to guarantee an accurate species determination in the fixed sample. An aliquot of this concentrated sample is preserved in formaldehyde and stored. Since mid 2016 a photo is taken from this concentrated sample on each sampling date. A species list of all phytoplankton taxa, which contribute to the total biovolume estimates (Appendix 1) and a list of stray findings (Appendix 2; single encountered species recorded in the concentrated live sample and in the fixed sample), are given in the Appendix.



For the identification and quantification of the phytoplankton we basically follow descriptions given in:

DIN EN 15204: 2006 -12 (D): Wasserbeschaffenheit – Anleitung für die Zählung von Phytoplankton mittels Umkehrmikroskopie (Utermöhl-Technik). Deutsche Fassung. <http://www.beuth.de/de/norm/din-en-15204/88755296>

and

TÜMPLING VON, W. & G. FRIEDRICH (Hrsg.) (1999): Methoden der biologischen Wasseruntersuchung, Bd. 2. Jena, Stuttgart, Lübeck, Ulm (G. Fischer Verlag).

Sample preservation: Samples are fixed with Lugol's solution (PADISÀK, KRIENITZ & SCHEFFLER; pages: 35-53; SCHWOERBEL 1994).

Lugol's solution:

50 g Potassium Iodide p.a. + 100 ml Aqua dest.

25 g double sublimated Iodine p.a.

250 ml Aqua dest.

25 ml 10% pure acetic acid

Stored in dark bottle; mixed for ca. 4 hours; keep cold

A few drops of the basic Lugol's solution are added to the phytoplankton sample (2 x 100mL bottles) until the sample reaches a 'Cognac like' color. Change in sample volume through adding the preservative are neglected.

Quantitative biovolume determination: Cell number and biovolume are determined using an inverted microscope (Utermöhl 1958). We use sedimentation tube volumes between 2–100 ml with a diameter of 2.5 cm. We use original Hydro-Bios (Kiel) tubes or tubes following the Hydro-Bios prototype that were built in the IGB workshop.

Sedimentation time table according to ROTT (1981)

Tube height (cm): Sedimentation time (h):

10	40
5	20
2	8
0.4	2

Counting procedure: Transects are counted across the middle of the chamber. If two transects are counted the chamber is turned by 180° for the analysis of a second transect. At least 400 individuals per sample are counted. For large (e.g. *Ceratium*) and rare species the entire chamber area is screened and counted. Data are documented in a counting protocol according to the programme developed by HAMILTON (1996); Version 3.1 B.

Determination of cell dimensions: Cell dimensions are determined via an ocular micrometer or a microscope camera. At least 20 individuals per species are measured if individual numbers are $n > 20$. Used magnifications are: 200 x; 400 x; 1000 x. If measuring of the third dimension (including cells in colonies) is not possible we use 'length - width - depth relationships' from the literature. For centric diatoms and cryptophytes we assume that cell length equals half of the cell diameter.

Biovolume determination: Cell biovolume estimates are based on simple geometric forms such as cuboid, sphere, cylinder, cone, spheroid (PADISÁK & ADRIAN 1999, pages 334-351). Cell biovolume estimates for e.g. *Ceratium*, *Staurastrum*, *Peridinium*, *Gymnodinium* are based on a mix of several different geometric forms, which make the best fit to the cell shape. A list of the specific geometric forms used for each species is given in Appendix 3.

Calculation of phytoplankton biomass: The biomass of a single species equals the product of the cell number in the sample and the determined biovolume assuming that:

$$10^9 \mu\text{m}^3 = 1 \text{ mm}^3 = 1 \text{ mg (specific weight = 1 g/cm}^3) = 10^6 \mu\text{m}^3 = 1 \mu\text{g}$$

The biomass of all single species is added up to gain the total biomass of the sample. Biomass is given in $\mu\text{g/liter}$ respectively mg/m^3 . For more detail of the biovolume - biomass relationships see MISCHKE & BEHREND (2007).

Recognition of counting problems or limitations: Cell numbers in colonies can only be an estimate. Counting of filamentous algae go sometimes across the two predetermined chamber transects. Some species such as centric diatoms, *Cryptomonas*, *Aulacoseira*, *Peridinium*, and *Gymnodinium* are assigned to size classes. Please notice: Finding rare species (biomass relevant) is limited if short sedimentation chambers are used. This is the case when total algal mass is high. We refer to rare species here, which are included in the database and contribute to the biovolume calculations. Additionally stray findings of single species in the live sample (see above) or the Utermöhl counts are recorded. A list of stray findings is given in Appendix 2.

Used microscopes: Nikon Diaphot 300; Axiovert 135

Number of processors and their taxonomic skills: The following people processed and counted the Müggelsee phytoplankton samples:

1979 - 1998:	Sigrid Hoeg
1998 - July 2015:	Helgard Täuscher
August 2015-ongoing:	Katrin Preuss

All three processors are skilled phytoplankton taxonomists. Prior to the change of each processor, the new person was trained for one year by the preceding person. Training of the 'new' processor was considered successful if discrepancies between parallel processing of the same sample by the respective

overlapping two processors were in the same range of parallel counting of the same sample by the 'old' processor.

Changes in taxonomic resolution: Since 1993, 1994, 1995 the taxonomic resolution has been increased due to the expertise of Judith Padisak, who spent several months at the IGB training Sigrud Hoeg. Since then, Aulacosira, centric diatoms, Peridinium, and Gymnodinium were additionally assigned to different size classes. Prior to 1995 unidentified taxa were aggregated on genus or family/class level, and are thus incorporated in the total algal biovolume. That means that the total algal biovolume of the entire time series reflects the total algal mass adequately.

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Taxonomic keys

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Appendix 1

Taxalist for biomass calculation

HTL ID	Phylum	Class	Taxon	Author and year	Synonym Taxon	Author and year Synonym	used Geoform
14	Cyano	Cyanophyceae	Anabaena affinis	Lemmermann 1898	Dolichospermum affine	(Lemmermann) Wacklin, L.Hoffmann & Komárek 2009	Ellipsoid
17	Cyano	Cyanophyceae	Anabaena circinalis	Rabenhorst ex Bornet & Flahault 1886	Dolichospermum sigmoideum	(Nygaard) Wacklin, L.Hoffmann & Komárek 2009	Ellipsoid
18	Cyano	Cyanophyceae	Anabaena compacta	(Nygaard) Hickel 1985 (Lemmermann) Komárková & Cronberg 1992	Dolichospermum compactum	(Nygaard) P.Wacklin, L.Hoffmann & J.Komárek 2009	Ellipsoid
19	Cyano	Cyanophyceae	Anabaena crassa		Dolichospermum crassum	(Lemmermann) P.Wacklin, L.Hoffmann & J.Komárek 2009 (Brébisson ex Bornet & Flahault)	Ellipsoid
21	Cyano	Cyanophyceae	Anabaena flos-aquae	Brébisson ex Bornet & Flauhault 1886	Dolichospermum flosaquae	P.Wacklin, L.Hoffmann & J.Komárek 2009	Ellipsoid
24	Cyano	Cyanophyceae	Anabaena lemmermannii	P.G.Richter in Lemmermann 1903	Dolichospermum lemmermannii	(Richter) P. Wacklin, L.Hoffmann & J.Komárek 2009	Ellipsoid
859	Cyano	Cyanophyceae	Anabaena mendotae	W.T.release 1889	Dolichospermum mendotae	(W.T.release) Wacklin, L.Hoffmann & Komárek 2009	Ellipsoid
26	Cyano	Cyanophyceae	Anabaena planctonica	Brunnthaler 1903		(Brunnthaler) Wacklin, L.Hoffmann & Komárek 2009	Ellipsoid
1267	Cyano	Cyanophyceae	Anabaena smithii	(Komárek) M.Watanabe 1992	Dolichospermum smitthii	(Komárek) Wacklin, L.Hoffmann & Komárek 2009	Ellipsoid
29	Cyano	Cyanophyceae	Anabaena solitaria	Klebahn 1895	Dolichospermum solitarium	(Klebahn) Wacklin, L.Hoffmann & Komárek 2009	Ellipsoid
31	Cyano	Cyanophyceae	Anabaena spec.	Bory de Saint Vincent ex Bornet & Flahault 1886			Ellipsoid
32	Cyano	Cyanophyceae	Anabaena spiroides	Klebahn 1895	Dolichospermum spiroides	(Klebhan) Wacklin, L.Hoffmann & Komárek 2009	Ellipsoid
37	Cyano	Cyanophyceae	Anabaenopsis elenkinii	V.V.Miller 1923			Ellipsoid
	Cyano	Cyanophyceae	Aphanizomenon aphanizomenoides	(Forti) Hortobágyi & Komárek 1979	Sphaerospermopsis aphanizomenoides	(Forti) Zapomelová and others 2010	Cylinder
54	Cyano	Cyanophyceae	Aphanizomenon flos-aquae	Ralfs ex Bornet & Flahault 1886			Cylinder
55	Cyano	Cyanophyceae	Aphanizomenon gracile	Lemmermann 1907		(Usachev) P.Rajaniemi and others 2005	Cylinder
56	Cyano	Cyanophyceae	Aphanizomenon issatschenkoi	(Usacev) Proshkina-Lavrenko 1968	Cuspidothrix issatschenkoi		Cylinder
58	Cyano	Cyanophyceae	Aphanizomenon spec.	Morren ex Bornet und Flahault 1888			Cylinder
136	Cyano	Cyanophyceae	Chroococcus spec.	Klebs 1892			Sphere
134	Cyano	Cyanophyceae	Chroococcus limneticus	(Kol.) Lemmermann 1898			Sphere
	Cyano		Cyano single cells non det.				Sphere
795	Cyano		Cyanophyceae colonies non det.				Sphere+Ellipsoid
267	Cyano	Cyanophyceae	Cylindrospermopsis raciborskii	(Woloszynska) Seenayya & Subba Raju 1972			Ellipsoid
431	Cyano	Cyanophyceae	Limnothrix planctonica	(Woloszynska) Meffert 1988			Cylinder
432	Cyano	Cyanophyceae	Limnothrix redekei	(Goor) Meffert 1988			Cylinder
433	Cyano	Cyanophyceae	Limnothrix spec.	Meffert 1988			Cylinder
452	Cyano	Cyanophyceae	Microcystis aeruginosa	(Kützing) Kützing 1846			Sphere
455	Cyano	Cyanophyceae	Microcystis flosaquae	(Wittrock) Kirchner 1898	Microcystis flosaquae	(Wittrock) Kirchner 1898	Sphere
458	Cyano	Cyanophyceae	Microcystis novacekii	(Komárek) Compère 1974			Sphere
459	Cyano	Cyanophyceae	Microcystis spec.	Kützing ex Lemmermann 1907			Sphere
460	Cyano	Cyanophyceae	Microcystis viridis	(A.Braun) Lemmermann 1903			Sphere
462	Cyano	Cyanophyceae	Microcystis wesenbergii	(Komárek) Komárek ex Komárek 2006			Sphere
581	Cyano	Cyanophyceae	Planktolyngbya spec.	Anagnostidis & Komárek 1988			Cylinder
584	Cyano	Cyanophyceae	Planktothrix agardhii	(Gomont) Anagnostidis & Komárek 1988			Cylinder
597	Cyano	Cyanophyceae	Pseudanabaena mucicola	(Naumann & Huber-Pestalozzi) Schwabe 1964			Cylinder
598	Cyano	Cyanophyceae	Pseudanabaena spec.	Lauterborn 1915			Cylinder
821	Cyano	Cyanophyceae	Woronichinia naegeliania	(Unger) Elenkin 1933			Sphere+Ellipsoid
72	Bacill	Bacillariophyceae	Asterionella formosa	Hassall 1850			Parallelepiped
83	Bacill	Coscinodiscophyceae	Aulacoseira spec.	Thwaites 1848			Cylinder
75	Bacill	Coscinodiscophyceae	Aulacoseira ambigua	(Grunow) Simonsen 1979			Cylinder
78	Bacill	Coscinodiscophyceae	Aulacoseira granulata	(Ehrenberg) Simonsen 1979			Cylinder
			Aulacoseira gran. var.				
79	Bacill	Coscinodiscophyceae	angustissima f. spiralis	(Hustedt) D.B.Czarnecki & D.C.Reinke 1982			Cylinder

Appendix 1

Taxalist for biomass calculation

HTL ID	Phylum	Class	Taxon	Author and year	Synonym Taxon	Author and year Synonym	used Geoform
282	Bacill	Bacillariophyceae	Diatoma spec.	Bory de Saint Vincent			Parallelepiped
283	Bacill	Bacillariophyceae	Diatoma tenuis	C.Agardh 1812			Parallelepiped
284	Bacill	Bacillariophyceae	Diatoma vulgaris	Bory 1824			Parallelepiped
	Bacill	Bacillariophyceae	Diatoms non det.				Parallelepiped
336	Bacill	Bacillariophyceae	Fragilaria capucina	Desmazières 1830			Parallelepiped
341	Bacill	Bacillariophyceae	Fragilaria construens - Formenkreis	(Ehrenberg) Grunow 1862			Parallelepiped
342	Bacill	Bacillariophyceae	Fragilaria crotonensis	Kitton 1869			Parallelepiped
343	Bacill	Bacillariophyceae	Fragilaria cyclopum	(Brutschy) Lange-Bertalot 1980	Synedra cyclopum	Brutschy 1922	1/2 Parallelepiped
347	Bacill	Bacillariophyceae	Fragilaria spec.	Lyngbye 1819			Parallelepiped
348	Bacill	Bacillariophyceae	Fragilaria ulna	(Nitzsch) Lange-Bertalot 1980			Parallelepiped
349	Bacill	Bacillariophyceae	Fragilaria ulna angustissima Sippen	(Grunow) Krammer & Lange-Bertalot 1991	Ulnaria ulna	(Nitzsch) Compère in Jahn et al. 2001	Parallelepiped
351	Bacill	Bacillariophyceae	Fragilaria ulna var. acus	(Kützing) Lange-Bertalot 1980	Ulnaria delicatissima	(Grunow) Aboal & P.C.Silva 2004	Parallelepiped
446	Bacill	Coscinodiscophyceae	Melosira varians	C.Agardh 1827	var. angustissima	(Grunow) Lange-Bertalot 2000	Cylinder
486	Bacill	Bacillariophyceae	Navicula spec.	Bory1822	Fragililaria acus		Parallelepiped
494	Bacill	Bacillariophyceae	Nitzschia acicularis - Formenkreis	(Kützing) W.Smith 1853			1/2 Parallelepiped
501	Bacill	Bacillariophyceae	Nitzschia fonticola	(Grunow) Grunow in Van Heurck 1881			1/2 Parallelepiped
502	Bacill	Bacillariophyceae	Nitzschia fruticosa	Hustedt 1957			1/2 Parallelepiped
506	Bacill	Bacillariophyceae	Nitzschia spec.	Hassal 1845			Parallelepiped
823	Bacill	Coscinodiscophyceae	single centric Diatoms(s.c. 5-50 µm)				Cylinder
690	Bacill	Mediophyceae	Skeletonema spec.	Grewille 1865			Cylinder
719	Bacill	Mediophyceae	Stephanodiscus binderanus	(Kützing) Krieger 1927			Cylinder
744	Bacill	Bacillariophyceae	Tabellaria spec.	Ehrenberg 1844			Parallelepiped
141	Crypto	Cryptophyceae	Chroomonas spec.	Hansgirg, 1885			Ellipsoid
225	Crypto	Cryptophyceae	Cryptomonas ovata (13-15 µm)	Ehrenberg 1832			Ellipsoid
242	Crypto	Cryptophyceae	Cryptomonas spec. (s.c. 10-60µm)	Ehrenberg, 1831			Ellipsoid
633	Crypto	Cryptophyceae	Rhodomonas spec.	G.Karsten 1898			Cone
627	Crypto	Cryptophyceae	Rhodomonas lens	Pascher & Ruttner in Pascher 1913			Ellipsoid
				Skuja 1948/Pascher & Ruttner in Pascher 1913	Rhodom. lacustris		
632	Crypto	Cryptophyceae	Rhodomonas minuta/lacustris	Ruttner in Pascher 1913	var. nannoplanctica	(Skuja) Javornicky 1976::Alga Base	Cone
144	Hapto	Prymnesiohyceae	Chrysochromulina spec.	Lackey, 1939			Cylinder
397	Hapto	Prymnesiohyceae	Hymenomonas roseola	Stein 1878			Ellipsoid
103	Miozoa	Dinophyceae	Ceratium furcoides	(Levander) Langhans 1925			Special form
104	Miozoa	Dinophyceae	Ceratium hirundinella	(O.F.Müller) Dujardin 1841			Special form
	Miozoa	Dinophyceae	Ceratium rhomvoldes	Hickel 1988			Special form
388	Miozoa	Dinophyceae	Gymnodinium helveticum	Penard 1891	Gyrodinium helveticum	(Penard) Y.Takano & T.Horiguchi 2004	Special form
390	Miozoa	Dinophyceae	Gymnodinium spec. (s.c. 10-30µm)	F.Stein 1878			Ellips.+Special form
416	Miozoa	Dinophyceae	Kolkwitiella acuta	(Apstein) Elbrächter 1993	Entzia acuta	(Apstein) Lebour 1922	Special form
547	Miozoa	Dinophyceae	Peridinium aciculiferum	Lemmaermann 1900			Special form
555	Miozoa	Dinophyceae	Peridinium spec. (s.c. 15-60 µm)	Ehrenberg, 1830			Special form
146	Ochro	Chrysophyceae	Chrysococcus spp.	Klebs 1892			Sphere
793	Ochro	Chrysophyceae	Chrysophyceae cells non det.				Sphere
149	Ochro	Chrysophyceae	Chrysoflagellata non det.				Ellipsoid
299	Ochro	Chrysophyceae	Dinobryon divergens	O.E.Imhof 1887			Ellipsoid
303	Ochro	Chrysophyceae	Dinobryon sociale	(Ehrenberg) Ehrenberg 1834			Ellipsoid
306	Ochro	Chrysophyceae	Dinobryon spec.	Ehrenberg, 1834			Ellipsoid

Appendix 1

Taxalist for biomass calculation

HTL ID	Phylum	Class	Taxon	Author and year	Synonym Taxon	Author and year Synonym	used Geoform
401	Ochro	Chrysophyceae	Kephyrion spec.	Pascher 1911			Ellipsoid
443	Ochro	Synurophyceae	Mallomonas spec.	Perty 1852			Cylinder
438	Ochro	Synurophyceae	Mallomonas akrokomos	Ruttner in Pascher 1913			Ellipsoid
600	Ochro	Chrysophyceae	Pseudokephyrion spec.	Pascher 1913			Ellipsoid
601	Ochro	Dictyochophyceae	Pseudopedinella erkensis	Skuja 1948			Sphere
740	Ochro	Synuraceae	Synura spec.	Ehrenberg 1834			Ellipsoid
741	Ochro	Synuraceae	Synura uvella	Ehrenberg 1834			Ellipsoid
1108	Ochro	Xanthophyceae	Trachydiscus spec.	Ettl 1964			Cylinder
	Ochro	Xanthophyceae	Tribonema angustissimum	Pascher 1939			Cylinder
778	Ochro	Xanthophyceae	Tribonema spec.	Derbès & Solier 1851			Cylinder
811	Ochro	Chrysophyceae	Uroglena spec.	Ehrenberg, 1834			Ellipsoid
158	Charo	Conjugatophyceae	Closterium aciculare	T.West 1860			Doublecone
161	Charo	Conjugatophyceae	Closterium acutum var. variabile	(Lemmermann) Willi Kreiger 1935			Doublecone
168	Charo	Conjugatophyceae	Closterium limneticum	Lemmermann 1899			Doublecone
173	Charo	Conjugatophyceae	Closterium spec.	Nitzsch ex Ralfs 1848			Doublecone
313	Charo	Klebsormidiophyceae	Elakatothrix spec.	Wille 1898			Doublecone
	Charo	Mesostigmatophyceae	Mesostigma viride	Lauterborn 1894			Cylinder
477	Charo	Conjugatophyceae	Mougeotia spec.	C.Agardh 1824, nom. cons.			Cylinder
5	Chloro	Trebouxiophyceae	Actinastrum hantzschii	Lagerheim 1882			Doublecone
	Chloro	Trebouxiophyceae	Actinastrum fluviatile	(J.L.B.Schröder) Fott 1977			Doublecone
6	Chloro	Trebouxiophyceae	Actinastrum spec	Lagerheim, 1882			Doublecone
49	Chloro	Chlorophyceae	Ankyra judayi	(G.M.Smith) Fott 1957			Doublecone
50	Chloro	Chlorophyceae	Ankyra lanceolata	(Korshikov) Fott 1957	Lanceola spatulifera	(Korshikov) Hindák 1988	Doublecone
52	Chloro	Chlorophyceae	Ankyra spec.	Fott 1957			Doublecone
100	Chloro	Chlorophyceae	Carteria spec.	Diesing 1866			Sphere
117	Chloro	Chlorophyceae	Chlamydomonas spec. (s.c. 5-15µm)	Ehrenberg 1834			Ellipsoid
	Chloro	Chlorophyceae	Chlorophyceae cells non det.				Sphere
	Chloro	Chlorophyceae	(s.c. 3-15 µm)				Sphere
	Chloro	Chlorophyceae	Chlorophyceae colonies non det.				Sphere
186	Chloro	Chlorophyceae	Coelastrum spec.	Nägeli 1849			Sphere
179	Chloro	Chlorophyceae	Coelastrum astroideum	De Notaris 1867			Sphere
181	Chloro	Chlorophyceae	Coelastrum microporum	Nägeli in A.Braun 1855			Sphere
						(Korshikov) I.Kostikov, T.Darienko, A.Lukesová & L.Hoffmann 2002	
191	Chloro	Chlorophyceae	Coenochloris polycocca	(Korshikov) Hindák 1984	Radiococcus polycoccus		Sphere
192	Chloro	Chlorophyceae	Coenochloris spec.	Korshikov 1953			Sphere
195	Chloro	Euglenophyceae	Colacium spec.	Ehrenberg, 1834			Ellipsoid
214	Chloro	Trebouxiophyceae	Crucigenia tetrapedia	(Kirchner) Kuntze 1898			Parallelepiped
						(Lemmermann) D.M.John, M.J.Wynne & P.M.Tsarenko 2014	
215	Chloro	Trebouxiophyceae	Crucigeniella apiculata	(Lemmermann) Komárek 1974	Willea apiculata		Ellipsoid
218	Chloro	Trebouxiophyceae	Crucigeniella spec.	Lemmermann, 1900, nom. illeg.	Crucigenia		Ellipsoid
	Chloro	Chlorophyceae	Dactylosphaerium spp.	Steinecke, 1916			Sphere
290	Chloro	Trebouxiophyceae	Dictyosphaerium spp.	Nägeli 1849			Sphere
294	Chloro	Trebouxiophyceae	Didymocystis spec.	Korshikov 1953			Ellipsoid
321	Chloro	Chlorophyceae	Eudorina spec.	Ehrenberg 1831			Sphere
806	Chloro	Chlorophyceae	Volvocales (incl. Spermatozopsis)	Korshikov 1913			Doublecone
366	Chloro	Chlorophyceae	Golenkinia radiata	Chodat 1894			Sphere

Appendix 1

Taxalist for biomass calculation

HTL ID	Phylum	Class	Taxon	Author and year	Synonym Taxon	Author and year Synonym	used Geoform
378	Chloro	Chlorophyceae	Gonium pectorale	O.F.Müller 1773			Ellipsoid
411	Chloro	Chlorophyceae	Kirchneriella spp.	Schmidle, 1893			Doublecone
415	Chloro	Trebouxiophyceae	Koliella spec.	Hindák 1963			Doublecone
422	Chloro	Trebouxiophyceae	Lagerheimia genevensis	(Chodat) Chodat 1895			Ellipsoid
426	Chloro	Trebouxiophyceae	Lagerheimia wratislawiensis	Schröder 1897			Ellipsoid
	Chloro	Trebouxiophyceae	Micractinium bornhemiense	(W.Conrad) Korshikov 1953			Sphere
450	Chloro	Trebouxiophyceae	Micractinium pusillum	Fresenius 1858			Sphere
451	Chloro	Trebouxiophyceae	Micractinium spec.	Fresenius 1858			
464	Chloro	Chlorophyceae	Monoraphidium arcuatum	(Korshikov) Hindák 1970	Ankistrodesmus arcuatus	Korshikov 1953	Doublecone
468	Chloro	Chlorophyceae	Monoraphidium contortum	(Thuret) Komárková-Legnerová in Fott 1969			Doublecone
473	Chloro	Chlorophyceae	Monoraphidium spec.	Komárková-Legnerová, 1969			Doublecone
471	Chloro	Chlorophyceae	Monoraphidium komarkovae	Nygaard 1979			Doublecone
469	Chloro	Chlorophyceae	Monoraphidium griffithii	(Berkeley) Komárková-Legnerová 1969			Doublecone
517	Chloro	Trebouxiophyceae	Oocystis spp.	Nägeli ex A.Braun 1855			Ellipsoid
527	Chloro	Chlorophyceae	Pandorina morum	(O.F.Müller) Bory 1824			Sphere
533	Chloro	Chlorophyceae	Pediastrum biradiatum	Meyen 1829			Cylinder
534	Chloro	Chlorophyceae	Pediastrum boryanum	(Turpin) Meneghini 1840			Cylinder
535	Chloro	Chlorophyceae	Pediastrum duplex	Meyen 1829			Cylinder
539	Chloro	Chlorophyceae	Pediastrum simplex	Meyen 1829			Cylinder
540	Chloro	Chlorophyceae	Pediastrum spp.	Meyen 1829			Cylinder
541	Chloro	Chlorophyceae	Pediastrum tetras	(Ehrenberg) Ralfs 1845			Cylinder
578	Chloro	Ulvophyceae	Planctonema lauterbornii	Schmidle 1903	Binuclearia lauterbornii	(Schmidle) Proschkina-Lavrenko 1966	Cylinder
582	Chloro	Chlorophyceae	Planktosphaeria gelatinosa	G.M.Smith 1918			Sphere
605	Chloro	Chlorophyceae	Pseudoschroederia spec.	Hegewald & Schnepf 1986			Doublecone
	Chloro	Chlorophyceae	Pseudoschroederia antillarum	(Komárek) Hegewald & Schnepf 1986			Doublecone
	Chloro	Chlorophyceae	Pseudoschroederia robusta	(Korshikov) E.Hegewald & E.Schnepf 1986			Doublecone
1032	Chloro	Chlorophyceae	Pteromonas angulosa	(H.J.Carter) Lemmermann 1900			Ellipsoid
	Chloro	Chlorophyceae	Pteromonas aculeata	Lemmermann 1900			Ellipsoid
609	Chloro	Chlorophyceae	Pteromonas spec.	Seligo, 1887			Ellipsoid
891	Chloro	Chlorophyceae	Raphidocelis spp.	Hindák, 1977			Doublecone
	Chloro	Chlorophyceae	Scenedesmus abundans	(O.Kirchner) Chodat 1913	Desmodesmus abundans	(Kirchner) E.Hegewald 2000	Ellipsoid
639	Chloro	Chlorophyceae	Scenedesmus acuminatus	(Lagerheim) Chodat 1902	Acutodesmus acuminatus	(Lagerheim) Tsarenko, 2001	Doublecone
641	Chloro	Chlorophyceae	Scenedesmus acutus	Meyen 1829	Acutodesmus obliquus	(Turpin) Hegewald & Hanagata, 2000	Doublecone
643	Chloro	Chlorophyceae	Scenedesmus armatus	(Chodat) Chodat 1913			Ellipsoid
	Chloro	Chlorophyceae	Scenedesmus communis	E.Hegewald 1977	Desmodesmus communis	E.Hegewald 2000;	Ellipsoid
651	Chloro	Chlorophyceae	Scenedesmus denticulatus	Lagerheim 1882	Desmodesmus denticulatus	(Lagerheim) S.S.An, T.Friedl & E.Hegewald 1999	Ellipsoid
660	Chloro	Chlorophyceae	Scenedesmus intermedius	Chodat 1926	Desmodesmus intermedius	(Chodat) E.Hegewald 2000	Ellipsoid
662	Chloro	Chlorophyceae	Scenedesmus linearis	Komárek 1974	Scenedesmus ellipticus	Corda 1835	Ellipsoid
	Chloro	Chlorophyceae	Scenedesmus maximus	(West & G.S.West) Chodat 1913	Desmodesmus maximus	(West & G.S.West) Hegewald 2000;	Ellipsoid
667	Chloro	Chlorophyceae	Scenedesmus opoliensis	P.G.Richter 1895	Desmodesmus opoliensis	(P.G.Richter) E.Hegewald 2000	Ellipsoid
669	Chloro	Chlorophyceae	Scenedesmus quadricauda	(Turpin) Brébisson in Brébisson & Godey 1835			Ellipsoid
675	Chloro	Chlorophyceae	Scenedesmus serratus	(Corda) Bohlin 1901	Desmodesmus serratus	(Corda) S.S.An, Friedl & E.Hegewald 1999	Ellipsoid
676	Chloro	Chlorophyceae	Scenedesmus spp.	Meyen 1829			Ellipsoid
677	Chloro	Chlorophyceae	Scenedesmus subspicatus	Chodat 1926	Desmodesmus subspicatus	(Chodat) E.Hegewald & A.Schmidt in E.Hegewald 2000	Ellipsoid
990	Chloro	Chlorophyceae	Schroederia nitzschioides	(G.S.West) Korschikov 1953			Doublecone
683	Chloro	Chlorophyceae	Schroederia spec.	Lemmermann, 1898			Doublecone
687	Chloro	Trebouxiophyceae	Siderocelis ornata	(Fott) Fott 1934			Ellipsoid

Appendix 1

Taxalist for biomass calculation

HTL ID	Phylum	Class	Taxon	Author and year	Synonym Taxon	Author and year Synonym	used Geoform
708	Chloro	Conjugatophyceae	Staurastrum gracile	Ralfs ex Ralfs 1848			Special form
712	Chloro	Conjugatophyceae	Staurastrum spec.	Meyen ex Ralfs 1848			Special form
748	Chloro	Chlorophyceae	Tetraedron caudatum	(Corda) Hansgirg 1888			Parallelepiped
751	Chloro	Chlorophyceae	Tetraedron minimum	(A.Braun) Hansgirg 1888			Parallelepiped
754	Chloro	Chlorophyceae	Tetraedron spec.	Kützing, 1845			Parallelepiped
756	Chloro	Chlorophyceae	Tetraedron trigonum	(Nägeli) Hansgirg 1888			Special form
759	Chloro	Chlorodendrophyceae	Tetraselmis spec.	F.Stein, 1878			Ellipsoid
922	Chloro	Chlorophyceae	Tetrastrum elegans	Playfair 1917			Sphere
761	Chloro	Chlorophyceae	Tetrastrum komarekii	Hindák 1977	Lemmermannia komarekii	(Hindák) C.Bock & Krienitz in Bock et al. 2013	Sphere
762	Chloro	Chlorophyceae	Tetrastrum punctatum	(Schmidle) Ahlstrom & Tiffany 1934	Lemmermannia punctata	(Schmidle) C. Bock & Krienitz, 2013	Sphere
760	Chloro	Chlorophyceae	Tetrastrum glabrum	(Y.V.Roll) Ahlstrom & Tiffany 1934			Sphere
763	Chloro	Chlorophyceae	Tetrastrum spec.	Chodat, 1895			Sphere
764	Chloro	Chlorophyceae	Tetrastrum staurogeniiforme	(Schröder) Lemmermann 1900			Sphere
86	Chloro	Chlorophyceae	Volvox aureus	Ehrenberg 1832			Sphere
814	Chloro	Chlorophyceae	Volvox spec.	Linnaeus em. Ehrenberg 1830			Sphere
326	Euglen	Euglenophyceae	Euglena spp.	Ehrenberg, 1830			Ellipsoid+Doublec
564	Euglen	Euglenophyceae	Phacotus lenticularis	(Ehrenberg) Deising 1866			Sphere
565	Euglen	Euglenophyceae	Phacotus spp.	Perty 1852			Sphere
770	Euglen	Euglenophyceae	Trachelomonas. spp.	Ehrenberg 1835			Ellipsoid

Appendix 2

Stray taxa and taxa specification based on determination in fresh net samples taken at sampling date

HTL ID	Phylum	Class	Taxon	Autor and year	Synonym Taxon	Author and year Synonym
		Planktomy	Planktomyces bekefii	Gimesi 1924		
28	Cyano	Cyanophyceae	Anabaena sigmoidea	Nygaard 1950	Dolichospermum sigmoideum	(Nygaard) Wacklin, L.Hoffmann & Komárek 2009
61	Cyano	Cyanophyceae	Aphanocapsa holsatica	(Lemmermann) G.Cronberg & Komárek 1994		
62	Cyano	Cyanophyceae	Aphanocapsa incerta	(Lemmermann) G.Cronberg & Komárek 1994		
	Cyano	Cyanophyceae	Aphanocapsa cf. parasitica	(Kützing) Komárek & Anagnostidis 1995		
64	Cyano	Cyanophyceae	Aphanocapsa spec.	C.Nägeli 1849		
65	Cyano	Cyanophyceae	Aphanothece cf. bachmannii	Komárková-Legnerová & G.Cronberg 1994	Anathece bachmannii	(Komárek & Cronberg) Komárek, Kastovsky & Jezberová, 2011
	Cyano	Cyanophyceae	Aphanothece cf. minutissima	(West) J.Komárková & G.Cronberg 1994	Anathece minutissima	(West) Komárek, Kastovsky & Jezberová 2011
66	Cyano	Cyanophyceae	Aphanothece clathrata	West & G.S.West 1906	Anathece clathrata	(W.West & G.S.West) Komárek, Kastovsky & Jezberová 2011
68	Cyano	Cyanophyceae	Aphanothece spec.	C.Nägeli 1849 nom. cons.		
134	Cyano	Cyanophyceae	Chroococcus limneticus	Lemmermann 1898	Limnococcus limneticus	(Lemmermann) Komárková and others 2010
137	Cyano	Cyanophyceae	Chroococcus turgidus	(Kützing) Nägeli 1849		
374	Cyano	Cyanophyceae	Coelomoron pusillum	(Van Goor) Komárek 1988		
1247	Cyano	Cyanophyceae	Cyanogranis ferruginea	(F.Wawrik) Hindák ex Hindák in Joosen 2006		
520	Cyano	Cyanophyceae	Limnothrix cf. lauterbornii	(Schmidle) Anagnostidis 2001	Oscillatoria lauterbornii	Schmidle 1901
	Cyano	Cyanophyceae	Limnothrix cf. obliqueacuminata	(Skuja) Meffert 1988		
	Cyano	Cyanophyceae	Limnothrix rosea	Meffert 1988	Oscillatoria rosea	Utermöhl 1925
	Cyano	Cyanophyceae	Microcystis cf. ichthyoblabe	(G.Kunze) Kützing		
	Cyano	Cyanophyceae	Microcystis natans	Lemmermann ex Skuja 1934		
	Cyano	Cyanophyceae	Oscillatoria cf. chlorina	Kützing ex Gomont 1892	Kamptonema chlorinum	(Kützing ex Gomont) Strunecký, Komárek & J.Smarda 2014
	Cyano	Cyanophyceae	Pannus spec.	Hickel 1991		
596	Cyano	Cyanophyceae	Pseudanabaena cf. limnetica	(Lemmermann) Komárek 1974		
619	Cyano	Cyanophyceae	Raphidiopsis mediterranea	Skuja 1937		
736	Cyano	Cyanophyceae	Synechococcus spec.	C.Nägeli 1849		
820	Cyano	Cyanophyceae	Woronichinia compacta	(Lemmermann) Komárek & Hindák 1988		
1	Bacill	Mediophyceae	Acanthoceras zachariasii	(Brun) Simonsen 1979		
12	Bacill	Bacillariophyceae	Amphora ovalis	(Kützing) Kützing 1844		
	Bacill	Bacillariophyceae	Aneumastus spec.	Mann & Stickle in Round et al. 1990		
81	Bacill	Coccosinodiscophyceae	Aulacoseira cf. islandica	(Otto Müller) Simonsen 1979		
	Bacill	Bacillariophyceae	Caloneis silicula	(Ehrenberg) Cleve 1894		
	Bacill	Bacillariophyceae	Caloneis amphibaena	(Bory) Cleve 1894		
1253	Bacill	Bacillariophyceae	Campylodiscus cf. hibernicus	Ehrenberg 1845	Iconella hibernica	(Ehrenberg) Ruck & Nakov in Ruck et al. 2016
	Bacill	Bacillariophyceae	Cavinula scutelloides	(W.Smith) Lange-Bertalot 1996		
	Bacill	Bacillariophyceae	Cocconeis disculus	(Schumann) Cleve in Cleve & Jentsch 1882		
177	Bacill	Bacillariophyceae	Cocconeis placentula	Ehrenberg 1838		
178	Bacill	Bacillariophyceae	Cocconeis spec.	Ehrenberg 1836		
269	Bacill	Bacillariophyceae	Cymatopleura solea	(Brébisson) W.Smith 1851		
271	Bacill	Bacillariophyceae	Cymbella lanceolata	(C.Agardh) Kirchner 1878	Brebissonia lanceolata	(C.Agardh) Mahoney & Reimer 1986
273	Bacill	Bacillariophyceae	Cymbella spec.	Agardh 1830		
272	Bacill	Bacillariophyceae	Encyonema prostratum	(Berkeley) Kützing 1844	Encyonema leibleinii	(C.Agardh) W.J.Silva, R.Jahn and others 2013
330	Bacill	Bacillariophyceae	Eunotia spec.	Ehrenberg 1837		
1173	Bacill	Bacillariophyceae	Fragil. parasitica var. subcons.	Grunow in Van Heurck 1881		
346	Bacill	Bacillariophyceae	Fragilaria reicheltii	(Voigt) Lange-Bertalot 1993		Centronella reicheltii Max Voigt 1901
369	Bacill	Bacillariophyceae	Gomphonema spec.	Ehrenberg 1832		
392	Bacill	Bacillariophyceae	Gyrosigma acuminatum	(Kützing) Rabenhorst 1853		
393	Bacill	Bacillariophyceae	Gyrosigma attenuatum	(Kützing) Rabenhorst 1853		
394	Bacill	Bacillariophyceae	Gyrosigma spec.	Hassall 1845		

Appendix 2

Stray taxa and taxa specification based on determination in fresh net samples taken at sampling date

HTL ID	Phylum	Class	Taxon	Autor and year	Synonym Taxon	Author and year Synonym
1188	Bacill	Bacillariophyceae	Hippodonta capitata	(Ehrenberg) Lange-Bertalot and others 1996	Navicula capitata	Ehrenberg 1838
483	Bacill	Bacillariophyceae	Navicula radiosa	Kützing 1844: 91, pl. 4: fig. 23		
983	Bacill	Bacillariophyceae	Navicula cf. gregaria	Donkin 1861		
930	Bacill	Bacillariophyceae	Navicula lanceolata	Ehrenberg 1838		
484	Bacill	Bacillariophyceae	Navicula reinhardtii	(Grunow) Grunow in Van Heurck 1880		
	Bacill	Bacillariophyceae	Navicula rhynchotella	Lange-Bertalot 1993		
1201	Bacill	Bacillariophyceae	Navicula slevicensis	Grunow in Van Heurck 1880		
984	Bacill	Bacillariophyceae	Navicula tripunctata	(O.F.Müller) Bory in Bory de Saint-Vincent 1822		
	Bacill	Bacillariophyceae	Navicula upsaliensis	(Grunow) M.Peragallo 1903		
1048	Bacill	Bacillariophyceae	Neidium cf. longiceps	(W.Gregory) R.Ross 1947		
1114	Bacill	Bacillariophyceae	Nitzschia capitellata	Hustedt in A.Schmidt et al. 1922		
504	Bacill	Bacillariophyceae	Nitzschia cf. palea	(Kützing) W.Smith 1856		
	Bacill	Bacillariophyceae	Nitzschia cf. sigma	(Kützing) W.Smith 1853		
500	Bacill	Bacillariophyceae	Nitzschia dissipata	(Kützing) Rabenhorst 1860		
505	Bacill	Bacillariophyceae	Nitzschia sigmoidea	(Nitzsch) W.Smith 1853		
576	Bacill	Bacillariophyceae	Pinnularia spec.	Ehrenberg, 1843, nom. et typ. cons.		
626	Bacill	Coscinodiscophyceae	Rhizosolenia longiseta	O.Zacharias 1893	Urosolenia longiseta	(O.Zacharias) Edlund & Stoermer 1993
634	Bacill	Bacillariophyceae	Rhicosphenia abbreviata	(C.Agardh) Lange-Bertalot 1980		
	Bacill	Bacillariophyceae	Sellaphora cf. bacillum	(Ehrenberg) D.G.Mann 1989		
482	Bacill	Bacillariophyceae	Sellaphora pupula	(Kützing) Mereschkovsky 1902		
	Bacill	Bacillariophyceae	Surirella bifrons	Ehrenberg 1843	Iconella bifrons	(Ehrenberg) Ruck & Nakov in Ruck et al. 2016
	Bacill	Bacillariophyceae	Surirella cf. biseriata	Brébisson in Brébisson & Godey 1835	Iconella biseriata	(Brébisson) Ruck & Nakov in Ruck et al. 2016
	Bacill	Bacillariophyceae	Surirella cf. linearis	W.Smith 1853	Iconella linearis	(W.Smith) Ruck & Nakov in Ruck et al. 2016
	Bacill	Bacillariophyceae	Surirella robusta	Ehrenberg 1841		
734	Bacill	Bacillariophyceae	Surirella spec.	Turpin 1822		
743	Bacill	Bacillariophyceae	Tabellaria flocculosa	(Roth) Kützing 1844		
87	Bigyra	Bikosea	Bicosoeca spec.	H.J.Clark 1866		
220	Crypto	Cryptophyceae	Cryptomonas rostratiformis	Skuja in Huber-Pestalozzi 1950	Cryptomonas curvata	Ehrenberg 1832
	Miozoa	Dinophyceae	Gymnodinium excavatum	Van Meel 1969		
1157	Ochro	Chrysophyceae	Anthophysa vegetans	(O.F.Müller) Stein 1878		
	Ochro	Xanthophyceae	Centritractus belenophorus	(Schmidle) Lemmermann 1900		
	Ochro	Xanthophyceae	Centritractus cf. brunneus	Fott 1941		
1055	Ochro	Xanthophyceae	Centritractus spec.	Lemmermann 1900, nom. cons.		
296	Ochro	Chrysophyceae	Dinobryon cf. bavaricum	Imhof 1890		
302	Ochro	Chrysophyceae	Dinobryon sertularia	Ehrenberg 1834		
977	Ochro	Xanthophyceae	Goniochloris spec.	Geitler 1928		
753	Ochro	Xanthophyceae	Isthmochloron gracile	(Reinsch) Skuja 1949	Tetraëdron gracile	(Reinsch) Hansgirg 1889
	Ochro	Synurophyceae	Microglena cf. punctifera	(O.F.Müller) Ehrenberg		
512	Ochro	Chrysophyceae	Ochromonas spec.	Wyssotzki 1887		
1249	Ochro	Synurophyceae	Syncrypta spec.	Ehrenberg 1834		
1210	Ochro	Eustigmatophyceae	Pseudostaurastrum spec.	Chodat 1921		
852	Ochro	Xanthophyceae	Trachydiscus sexangulatus	H.Ettl 1964		
810	Ochro	Chrysophyceae	Uroglena cf. americana	G.N.Calkins 1892	Uroglenopsis americana	(G.N.Calkins) Lemmermann 1899
	Ochro	Chrysophyceae	Uroglena volvox	Ehrenberg 1834		
172	Charo	Conjugatophyceae	Closterium cf. pronum	Brébisson 1856		
169	Charo	Conjugatophyceae	Closterium moniliferum	Ehrenberg ex Ralfs 1848		
	Charo	Conjugatophyceae	Cosmarium cf. praemarsum	Brébisson 1856		

Appendix 2

Stray taxa and taxa specification based on determination in fresh net samples taken at sampling date

HTL ID	Phylum	Class	Taxon	Autor and year	Synonym Taxon	Author and year Synonym
206	Charo	Conjugatophyceae	Cosmarium spec.	Corda ex Ralfs 1848		
712	Charo	Conjugatophyceae	Staurastrum cf. smithii	Teiling 1946		
	Chloro	Trebouxiophyceae	Actinastrum schroeteri	G.E. Huber-Pestalozzi		
	Chloro	Chlorophyceae	Ankistrodesmus cf. densus	Korshikov 1953		
41	Chloro	Chlorophyceae	Ankistrodesmus fusiformis	Corda 1838		
	Chloro	Trebouxiophyceae	Apathococcus lobatus	(Chodat) J.B.Petersen 1928		
94	Chloro	Trebouxiophyceae	Botryococcus braunii	Kützing 1849		
184	Chloro	Chlorophyceae	Coelastrum reticulatum	(P.A.Dangeard) Senn 1899	Hariotina reticulata	P.A.Dangeard 1889
196	Chloro	Trebouxiophyceae	Coronastrum ellipsoideum	Fott 1946		
1238	Chloro	Trebouxiophyceae	Coronastrum lunatum	R.H.Thompson 1950		
212	Chloro	Trebouxiophyceae	Crucigenia quadrata	Morren 1830		
162	Chloro	Trebouxiophyceae	Dicellula planctonica	Svirenko 1926	Dicellula geminata	(Printz) Korshikov 1953
289	Chloro	Trebouxiophyceae	Dictyosphaerium pulchellum	H.C.Wood 1873	Mucidosphaerium pulchellum	(H.C.Wood) C.Bock, Proschold & Krienitz 2011
320	Chloro	Chlorophyceae	Eudorina elegans	Ehrenberg 1832		
331	Chloro	Chlorophyceae	Eutetramorus fottii	(Hindák) Komárek 1979	Coenochloris fottii	(Hindák) Tsarenko 1990
332	Chloro	Chlorophyceae	Eutetramorus spec.	Walton 1918		
	Chloro	Chlorophyceae	Eutetramorus tetrasporus	Komárek 1983		
356	Chloro	Trebouxiophyceae	Franceia amphitricha	(Lagerheim) Hegewald 1980		
509	Chloro	Chlorophyceae	Kirchneriella obesa	(West) West & G.S.West 1894		
413	Chloro	Trebouxiophyceae	Koliella longiseta	(Vischer) Hindák 1963		
	Chloro	Trebouxiophyceae	Koliella spirotaenia	(G.S.West) Hindák 1963		
425	Chloro	Trebouxiophyceae	Lagerheimia cf. subsalsa	Lemmermann 1898		
	Chloro	Trebouxiophyceae	Lagerheimia chodatii	C.Bernard 1908		
420	Chloro	Trebouxiophyceae	Lagerheimia ciliata	(Lagerheim) Chodat 1895		
421	Chloro	Trebouxiophyceae	Lagerheimia citriformis	(J.W.Snow) Collins 1909		
423	Chloro	Trebouxiophyceae	Lagerheimia longiseta	(Lemmermann) Printz 1914		
	Chloro	Chlorophyceae	Lobomonas ampla	Pascher 1927		
435	Chloro	Chlorophyceae	Lobomonas spec.	P.-A.Dangeard 1899		
	Chloro	Trebouxiophyceae	Micractinium quadrisetum	(Lemmermann) G.M.Smith 1916		
515	Chloro	Trebouxiophyceae	Oocystis cf. marssonii	Lemmermann 1898		
513	Chloro	Trebouxiophyceae	Oocystis borgei	J.W.Snow 1903		
528	Chloro	Chlorophyceae	Pandorina spec.	Bory de Saint Vincent 1824		
529	Chloro	Chlorophyceae	Paradoxia multisetata	Svirenko 1928		
591	Chloro	Chlorophyceae	Polyedriopsis spinulosa	(Schmidle) Schmidle 1899		
275	Chloro	Chlorophyceae	Pseudodictyosphaerium jurisii	(Hindák) Hindák 1988	Mychonastes jurisii	(Hindák) Krienitz, C.Bock, Dadheech & Proschold, 2011
	Chloro	Chlorophyceae	Pseudoschroederia robusta	(Korshikov) E.Hegewald & E.Schnepf 1986		
610	Chloro	Pyramimonadophyceae	Pyramimonas spec.	Schmarda 1849		
	Chloro	Chlorophyceae	Raphidocelis van-goori			
647	Chloro	Chlorophyceae	Scenedesmus brasiliensis	Bohlin 1897	Desmodesmus brasiliensis	(Bohlin) E.Hegewald 2000
	Chloro	Chlorophyceae	Scenedesmus cf. pseudohystrix	Massjuk 1962	Desmodesmus hystrix	(Lagerheim) E.Hegewald 2000
652	Chloro	Chlorophyceae	Scenedesmus dimorphus	(Turpin) Kützing 1834	Acutodesmus dimorphus	(Turpin) Tsarenko, 2001
655	Chloro	Chlorophyceae	Scenedesmus ecornis	(Ehrenberg) Chodat 1926		
	Chloro	Chlorophyceae	Scenedesmus multispina	Svirenko 1924		
1101	Chloro	Chlorophyceae	Scenedesmus ovalternus	Brébisson in Brébisson & Godey 1855		
682	Chloro	Chlorophyceae	Schroederia cf. setigera	(Schröder) Lemmermann 1898		
683	Chloro	Chlorophyceae	Schroederia spec.	Lemmermann 1898		
	Chloro	Chlorophyceae	Selenastrum bibraianum	Reinsch 1866		

Appendix 2

Stray taxa and taxa specification based on determination in fresh net samples taken at sampling date

HTL ID	Phylum	Class	Taxon	Author and year	Synonym Taxon	Author and year Synonym
	Chloro	Chlorophyceae	Selenastrum gracile	Reinsch 1866	Messastrum gracile	(Reinsch) T.S.Garcia in T.S.Garcia et al. 2016
1042	Chloro	Chlorophyceae	Spermatozopsis cf. exsultans	Korshikov 1913		
	Chloro	Chlorophyceae	Steinedesmus arcuatus	(Lemmermann 1898) Comas et Komarek 1985		
746	Chloro	Trebouxiophyceae	Tetrachlorella alternans	(G.M.Smith) Korshikov 1939		
755	Chloro	Chlorophyceae	Tetraedron triangulare	Korshikov 1953		
774	Chloro	Chlorophyceae	Treubaria spec.	C.Bernard 1908		
813	Chloro	Chlorophyceae	Volvox globator	Linnaeus 1758		
1244	Chloro	Chlorophyceae	Westella cf. botryoides	(West) De Wildeman 1897		
322	Euglen	Euglenophyceae	Euglena acus	(O.F.Müller) Ehrenberg 1830	Lepocinclis acus	(O.F.Müller) B.Marin & Melkonian in Marin et al. 2003
323	Euglen	Euglenophyceae	Euglena ehrenbergii	G.A.Klebs 1883		
998	Euglen	Euglenophyceae	Lepocinclis oxyuris	(Schmarda) B.Marin & Melkonian 2003		
566	Euglen	Euglenophyceae	Phacus longicauda	(Ehrenberg) Dujardin 1		
567	Euglen	Euglenophyceae	Phacus pleuronectes	(O.F.Müller) Nitzsch ex Dujardin 1841		
732	Euglen	Euglenophyceae	Strombomonas spec.	Deflandre 1930		

Appendix 3

Centric diatoms determined in Naphrax - slide preparations

HTL ID	Phylum	Class	Taxon	Author and year	Synonym Taxon	Author and year Synonym
7	Bacill	Coscinodiscophyceae	Actinocyclus normannii	(W.Gregory ex Greville) Hustedt 1957		
1260	Bacill	Mediophyceae	Cyclostephanos delicatus	(S.I.Genkel) S.J.Casper & W.Scheffler 1990		
247	Bacill	Mediophyceae	Cyclostephanos dubius	(Hustedt) Round in Theriot et al. 1988		
248	Bacill	Mediophyceae	Cyclostephanos invisitatus	(Hohn & Hellermann) Theriot a.o. 1988		
250	Bacill	Mediophyceae	Cyclotella atomus	Hustedt 1937		
252	Bacill	Mediophyceae	Cyclotella cf. comensis	Grunow in van Heurck 1882	Pantocsekiella comensis	(Grunow) K.T.Kiss & E.Ács in Ács et al. 2016
260	Bacill	Mediophyceae	Cyclotella meneghiniana	Kützing 1844		
262	Bacill	Mediophyceae	Cyclotella pseudostelligera	Hustedt 1939		
264	Bacill	Mediophyceae	Cyclotella radiosa	(Grunow) Lemmermann 1900		
	Bacill	Mediophyceae	Cyclotella cf. schumannii	(Grunow) H.Håkansson 1990		
266	Bacill	Mediophyceae	Cyclotella cf. stelligera	(Cleve & Grunow) Van Heurck 1882		
1168	Bacill	Bacillariophyceae	Fragilaria cf. brevistriata	Grunow in van Heurck 1885		
1170	Bacill	Bacillariophyceae	Fragilaria construens f. venter	(Ehrenberg) Hustedt 1957	Staurosira venter	(Ehrenberg) Cleve & J.D.Möller 1879
717	Bacill	Mediophyceae	Stephanodiscus alpinus	Hustedt in Huber-Pestalozzi 1942		
721	Bacill	Mediophyceae	Stephanodiscus hantzschii	Grunow in Cleve & Grunow 1880		
723	Bacill	Mediophyceae	Stephanodiscus minutulus	(Kützing) Cleve & Möller 1882		
725	Bacill	Mediophyceae	Stephanodiscus neoastraea	Håkansson & Hickel 1986		
	Bacill	Mediophyceae	Thalassiosira cf. bramaputrae	(Ehrenberg) Håkansson & Locker 1981		
1035	Bacill	Mediophyceae	Thalassiosira lacustris	(Grunow) Hasle in Hasle & Fryxell 1977		
766	Bacill	Mediophyceae	Thalassiosira weissflogii	(Grunow) G.Fryxell & Hasle 1977	Conticribra weissflogii	(Grunow) Stachura-Suchoples & D.M.Williams 2009

List notes

Taxonomy, Names, Authors, years of description and accepted synonyms where compared and collected from the literature, Algaebase, WoRMS (World Register of Marine Species)

HTL ID Numbers are taken from "Harmonisierte Taxaliste Phytoplankton 2009";

Accepted synonyms are listed next to the taxa names that are used in the long-term-monitoring programme of Lake Müggelsee; Names in 'grey mark fields' are currently used

Abbreviations "Phylum":

Cyanobactæ Cyano

Planktomyi Planktomy

Bacillariopl Bacill

Cryptophyt Crypto

Haptophyt Hapto

Ochrophyt Ochro

Charophytæ Charo

Chlorophyt Chloro

Euglenophy Euglen

Appendix 1

Taxa list for biomass calculation (sources: Literature, Algaebase, WoRMS, HTL)

Geoforms are taken from the counting program "Algamica vers. 3.1 _1996"

Appendix 2

Stray taxa and taxa specification based on determination in fresh net samples taken at sampling date

Included are rare taxa as well as taxa where specification can only be done in life samples

Included are benthic diatoms with repeated occurrence (additional known from determination in Naphrax-slide preparations)

Appendix 3

Centric diatoms determined in Naphrax - slide preparations

Centric Diatoms are frequently determined for calculation of the Phyto-See Index in context to the WFD (about 20 sampling dates per year)