

Burns Lake Phytoplankton Summary Report 2021-2022

Overview

Samples were collected from two sites on Burns Lake during 2021 and 2022 (Table 1; Figure 1). Algae were identified to the taxonomic level genus and grouped into broad alga types for analysis.

Table 1: Sample sites and dates sampled in 2021 and 2022

Sample Site (EMS#)	Dates
BURNS LAKE; DEEP STN #2 (1130618)	2021-08-18
	2022-06-01
	2022-08-23
BURNS LAKE NEAR DEADMAN'S ISLAND (0400379)	2021-05-11
	2021-08-18
	2022-06-01
	2022-08-23
Total= 7 samples	

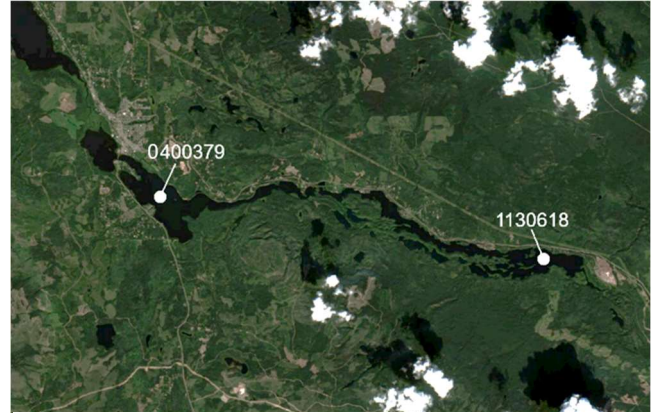


Figure 1: Aerial view of Burns Lake

Burns Lake had small increases in diatom density in the spring; *Asterionella*, *Aulacoseira* were the dominant genera (Figure 2). Spring blooms of diatoms are common and reflective increased temperatures, light penetration, and silica in the water following ice thaw (Kong et al., 2021).

Diatoms are integral to aquatic food webs because they are the foundation of the food web (jrobyn, 2019). Diatoms increase the resiliency and health of water systems by reducing nutrient levels and preventing monoculture blooms of less desirable algae (jrobyn, 2019). Colony forming diatoms such as *Asterionella* and *Aulacoseira* sp. can avoid grazing pressures by developing into large colonies reducing their availability for zooplankton and microscopic invertebrates (Baker, 2012).

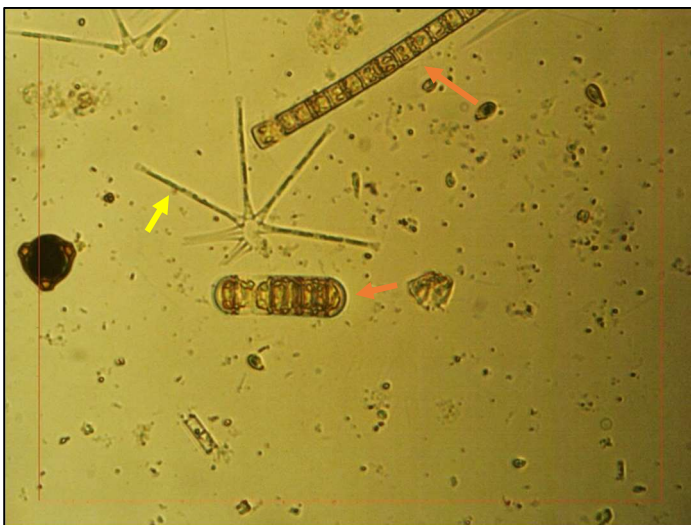


Figure 2: EMS Site#0400379 collected on 2022-06-01 with dominant genera *Asterionella* (yellow arrow), *Aulacoseira* (orange arrows)

Overview (continued)

Small quantities of the dinoflagellate *Ceratium* were identified in Burns Lake. Despite low numbers, this dinoflagellate represented 22% of biovolumes. This is because of *Ceratium*'s large size relative to other algae (Figure 3).

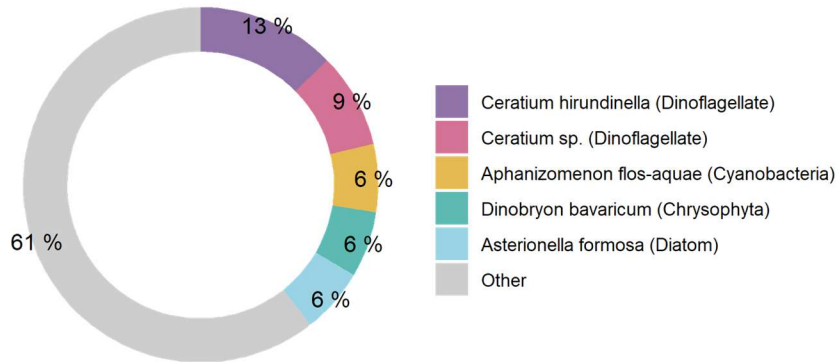


Figure 3: Dominant organisms from Burns Lake (all sites / dates) as percent of total biovolume

Marine species of *Ceratium* are associated with toxic red tides, however little evidence exists linking freshwater *Ceratium* blooms with the production of toxic secondary metabolites (*An Image-Based Key: Ceratium (Dinophyceae)*, 2017).

Samples collected on 2022-06-01 contained elevated densities of Chrysophyta (genus *Dinobryon*; Figure 4). The *Dinobryon* bloom included swimmers (sexual reproductive stages) and stomatocysts (asexual reproductive stages). Stomatocysts are normally produced at 0.05% the rate swimmers are produced (Lee, 2008). When *Dinobryon* populations are in a nitrogen-depleted environment, asexual stomatocysts rise from 0.05% to 4%. *Dinobryon* blooms are associated with unpleasant fishy odors, and one species of *Dinobryon* is linked with a toxin which can affect fish vitality (Cantrell & Long, 2013; Conrad, 2013).



Figure 4: Spring *Dinobryon* bloom included swimmers still in the loricas (yellow arrows) and stomatocysts (red arrows)

Algae – why should we care?

Algae blooms are becoming more frequent and severe worldwide due to excessive nutrient loading and warming summer lake temperatures. Diatom blooms can cause filter clogging, and odor issues.

Intense cyanobacteria blooms can threaten human safety and aquatic health through their toxicity. Illness related to cyanotoxins can include: liver, kidney, and nerve cell damage, cancer, skin and gut irritation, and neurological issues. Cyanotoxins, including microcystins, are now known to accumulate in the food chain (Lance et al. 2014). Fish from lakes with heavy cyanobacteria blooms can have higher toxin concentrations than the lake water (Greer et al. 2021) and consuming them can increase the risk of liver disease (Zhao et al., 2020).

Cyanobacterial Presence

Summer samples contained higher cyanobacteria concentrations than spring samples (Figure 5). Dominant cyanobacteria genera included *Anabaena*, *Anacystis*, and *Aphanizomenon*. *Aphanocapsa*, *Aphanothece*, and *Snowella* were also identified.

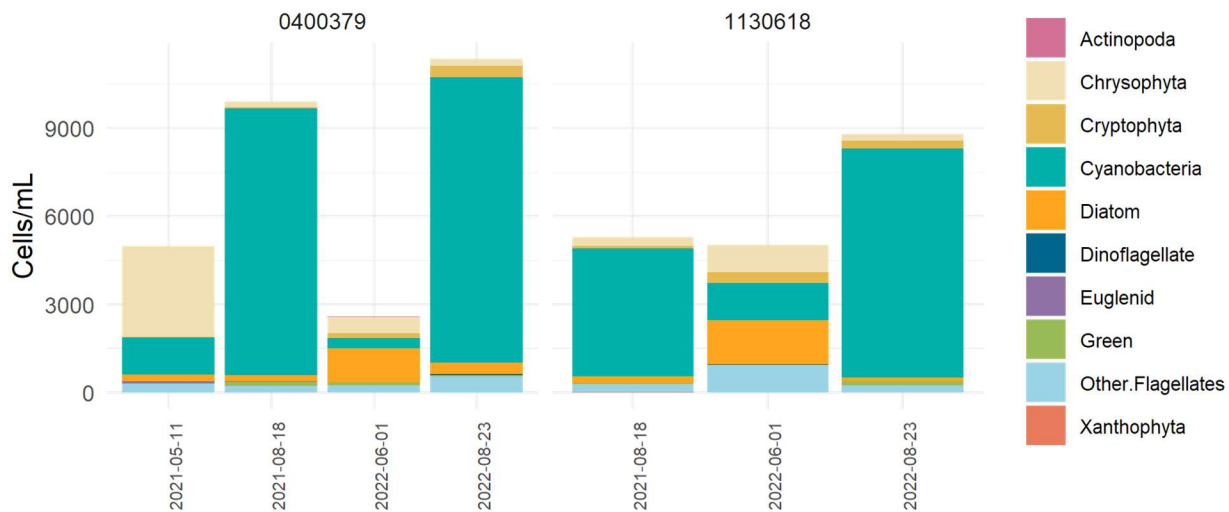


Figure 5: cell abundance for dominant cyanobacteria genera on Burns Lake

During blooms, species of *Anabaena* and *Aphanizomenon* produce both negative odor/taste compounds and toxic secondary metabolites. *Anabaena* blooms can quickly accumulate, develop odor metabolites, and color water systems (EPA, 2022). Other dominant cyanobacteria identified in the summer samples are also associated with several cyanotoxins that represent risks to public health (Table 2). Illness related to cyanotoxins can include liver, kidney, and nerve cell damage, cancer, skin and gut irritation, and neurological issues (Lance et al., 2014).

Table 2: Dominant genera of cyanobacteria on Burns Lake and their associated toxins

Genus	Maximum Abundance* (cells/mL)	Toxins Produced
<i>Anabaena</i>	4197	Lyngbyatoxin LYN, Apoptogen Toxin (ApoptX), Lipopolysaccharide LPS, Cylindospermopsin CYN, Microcystin MC, Anatoxins (-a) ATX, Saxitoxins SAX neosaxitoxin NEO, BMAA, Cyanopeptolins CPL, Anabaenopeptins APT, Taste and Odor
<i>Anacystis</i>	2652	Lyngbyatoxin LYN, Lipopolysaccharide LPS, Microcystin MC, Nodularins NOD, Anatoxins (-a) ATX, BMAA, Cyanopeptolins CPL, Anabaenopeptins APT
<i>Aphanizomenon</i>	2011	Lyngbyatoxin LYN, Lipopolysaccharide LPS, Cylindospermopsin CYN, Microcystin MC, Anatoxins (-a) ATX, Saxitoxins SAX neosaxitoxin NEO, BMAA, Anabaenopeptins APT, Taste and Odor

Note: * = counted in samples

Cyanobacterial Presence (Continued)

Dominant species of cyanobacteria found in Burns Lake can produce cyanotoxins (Table 2).

Burns Lake displayed cyanobacteria levels in the negligible-low risk category, with a mean cyanobacteria abundance of 4,844 cells/mL (Figure 6). Figure 6 exhibits the range of cyanobacterial abundance observed in Burns Lake compared to alert levels defined by several authorities including the WHO and the EPA.

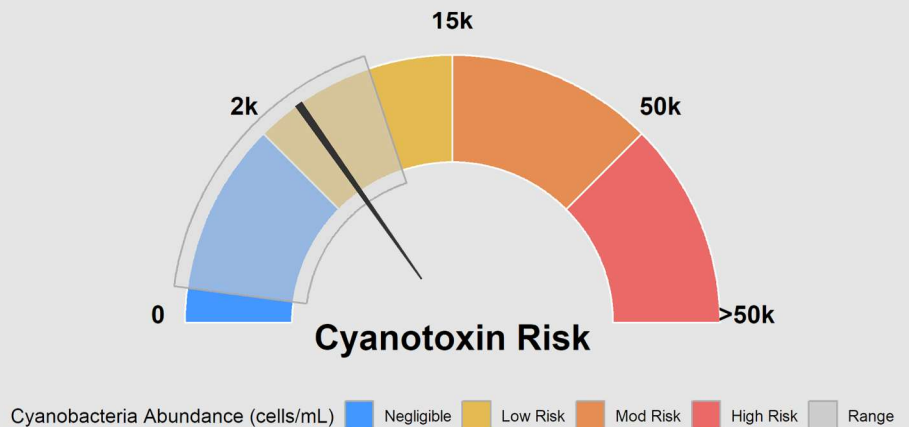


Figure 6: Cyanotoxin risk posed by cyanobacteria blooms in Burns Lake

Cyanobacteria frequently dominate algal communities in total cell count, but because of their small cell size their biovolume is usually low relative to the other types of algae present. This can be seen in Figure 7 where a single *Ceratium* cell is equivalent to approximately 100 cyanobacteria cells.

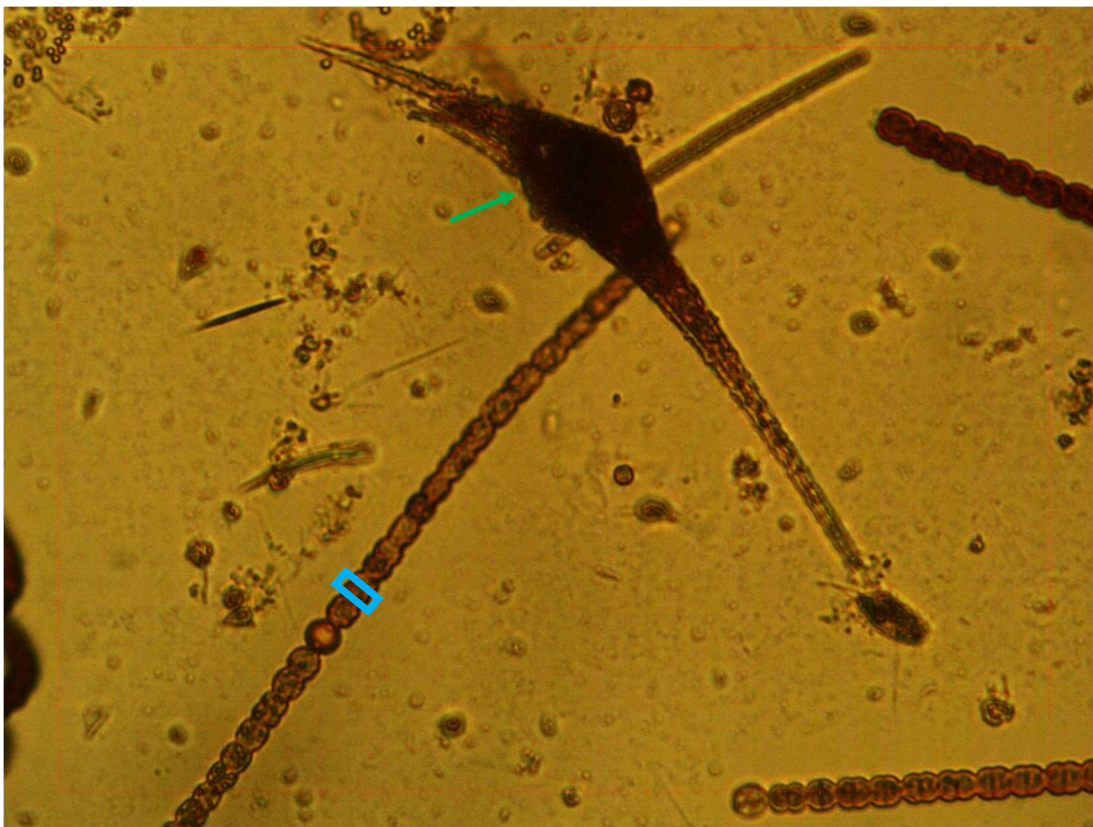


Figure 7: Size comparison of *Ceratium* (green arrow) to *Anabaena* cell (blue box)

Species Composition

Algae samples were identified to the genus level and grouped into broad alga types for analysis. The figures below display the total cell counts for each broad algae group alongside their biovolume. The difference between Figure 8 (cell abundance) and Figure 9 (biovolume) illuminates the difference between cell abundance and biovolume.

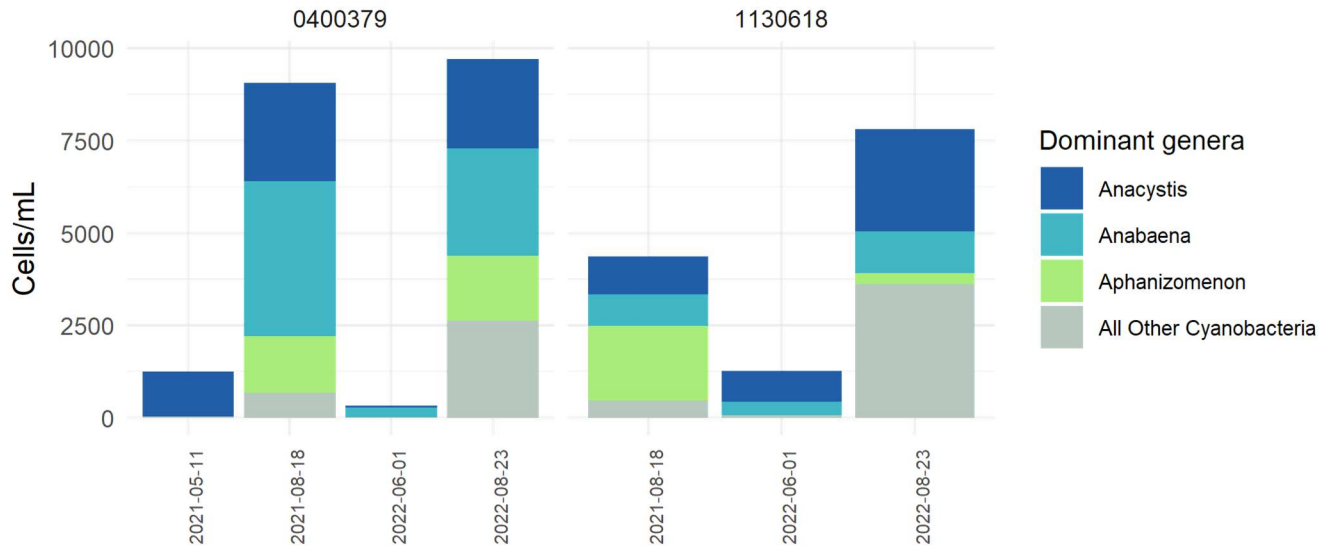


Figure 8: Cell abundance of high-level taxa groups on Burns Lake

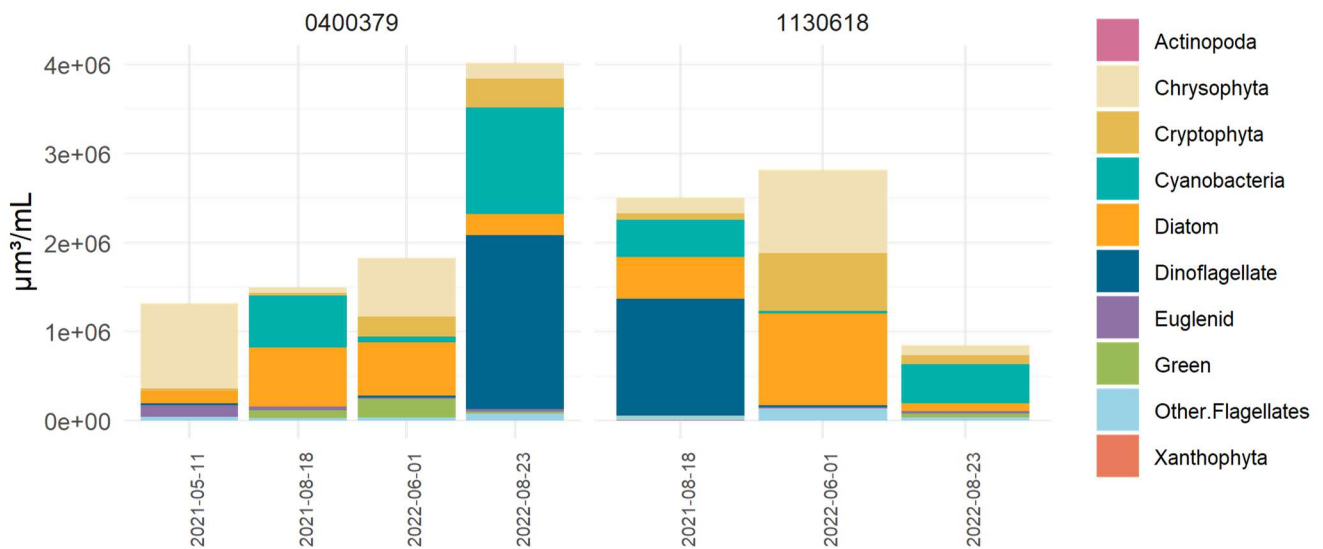


Figure 9: Biovolume of high-level taxa groups on Burns Lake

References

- An Image-Based Key: Ceratium (Dinophyceae)*. (2017, November). University of New Hampshire.
- Baker, A. L. et al. (2012). *Phycokey -- an image based key to Algae (PS Protista), Cyanobacteria, and other aquatic objects*. University of New Hampshire Center for Freshwater Biology.
<http://cfb.unh.edu/phycokey/phycokey.htm>
- Cantrell, R., & Long, B. (2013). *Dinobryon*. PBWorks. <http://ohapbio12.pbworks.com/w/page/51731561/Dinobryon>
- Conrad, J. (2013). *DINOBRION, a Golden Alga*. Jim Conrad's Naturalist Newsletter.
<https://www.backyardnature.net/n/x/dinobryo.htm>
- EPA. (2022, September). *Learn about Cyanobacteria and Cyanotoxins*. United States Environmental Protection Agency.
- jrobyn. (2019). *How Diatoms Benefit a Body of Water - BioNova®*. BioNova. <https://bionovanaturalpools.com/how-diatoms-benefit-a-body-of-water/>
- Kong, X., Seewald, M., Dadi, T., Friese, K., Mi, C., Boehrer, B., Schultze, M., Rinke, K., & Shatwell, T. (2021). Unravelling winter diatom blooms in temperate lakes using high frequency data and ecological modeling. *Water Research*, 190, 116681. <https://doi.org/10.1016/J.WATRES.2020.116681>
- Lance, E., Petit, A., Sanchez, W., Paty, C., Gérard, C., & Bormans, M. (2014). Evidence of trophic transfer of microcystins from the gastropod *Lymnaea stagnalis* to the fish *Gasterosteus aculeatus*. *Harmful Algae*, 31, 9–17. <https://doi.org/10.1016/J.HAL.2013.09.006>
- Lee, R. E. (2008). Phycology. In *Phycology* (Fourth, pp. 344–343). Cambridge University Press.
- Zhao, Y., Yan, Y., Xie, L., Wang, L., He, Y., Wan, X., & Xue, Q. (2020). Long-term environmental exposure to microcystins increases the risk of nonalcoholic fatty liver disease in humans: A combined fisher-based investigation and murine model study. *Environment International*, 138, 105648.
<https://doi.org/10.1016/J.ENVINT.2020.105648>

Report prepared by: Larratt Aquatic Consulting Ltd.

Stephanie Butt: Taxonomist, H. B.Sc., BIT.



Jamie Self: Senior Aquatic Biologist, R.P. Bio



Reviewed by:

Sara Knezevic: Field Biologist, B.Sc., BIT.



Appendix

Additional figures and raw data are listed below:

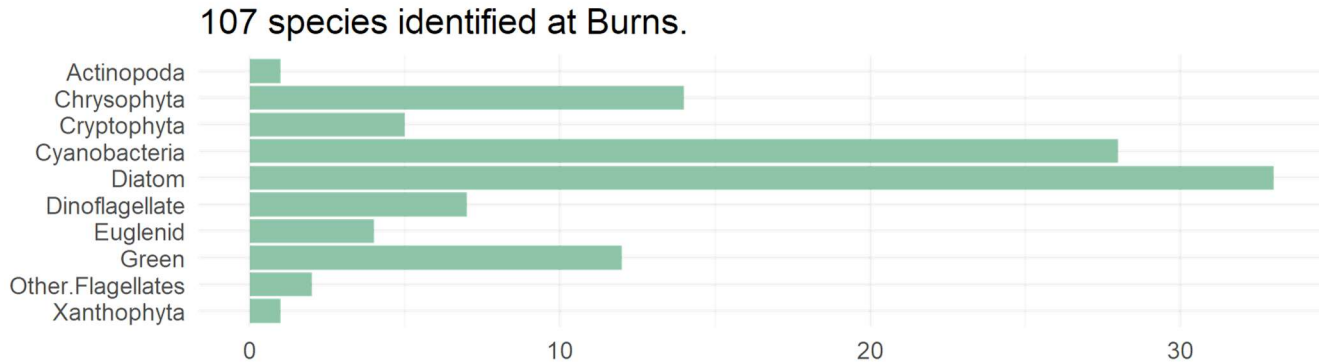


Figure 10: Identified species sorted into categories of higher-level taxa

Report.Name	Abundance (cells/mL)	Biovolume ($\mu\text{m}^3/\text{mL}$)	High.Level.Taxa	ITIS Genus Number
Mallomonas sp.	49	148191	Chrysophyta	1598
Ochromonas sp.	61	13058	Chrysophyta	1455
Chrysochromulina sp.	144	5539	Chrysophyta	2160
Chromulina sp.	15	26507	Chrysophyta	1717
Chrysocapsa planktonica	2781	745538	Chrysophyta	1860
Chrysococcus sp.	49	16269	Chrysophyta	1751
Cryptomonas sp.	15	27781	Cryptophyta	10635
Rhodomonas lacustris	4	434	Cryptophyta	10663
Anacystis sp.	1207	2297	Cyanobacteria	609
Dactylococcopsis sp.	27	1838	Cyanobacteria	6446
Planktolyngbya sp.	19	236	Cyanobacteria	
Aulacoseira italica	27	13479	Diatom	590863
Aulacoseira distans var. nivalis	76	15281	Diatom	590863
Aulacoseira granulata	23	7565	Diatom	590863
Cocconeis pediculus	4	6318	Diatom	3577
Cyclotella meneghiniana	68	30840	Diatom	2439
Lindavia bodanica	11	11478	Diatom	
Nitzschia sp.	11	1009	Diatom	5070
Stephanodiscus hantzschii	4	28835	Diatom	2415
Ulnaria ulna	4	21019	Diatom	970000
Gymnodinium uliginosa	4	15811	Dinoflagellate	10031
Trachelomonas sp.	30	106029	Euglenid	9690
Euglena sp.	46	26494	Euglenid	9620
microflagellate	307	51652	Other.Flagellates	

Figure 11: Raw data from 2021-05-11 EMS site 0400379

EMS ID: 400379	Total Abundance (cells/mL):	9913		
Collection Date: 2021-08-18	Total Biovolume (µm³/mL):	1503102		
Report.Name	Abundance (cells/mL)	Biovolume (µm³/mL)	High.Level.Taxa	ITIS Genus Number
Ochromonas sp.	76	16269	Chrysophyta	1455
Chrysochromulina sp.	57	2192	Chrysophyta	2160
Chromulina sp.	15	26507	Chrysophyta	1717
Chrysocapsa planktonica	8	2145	Chrysophyta	1860
Chrysococcus sp.	42	13945	Chrysophyta	1751
Dinobryopsis sp.	8	2149	Chrysophyta	1557
Cryptomonas sp.	15	27781	Cryptophyta	10635
Rhodomonas lacustris	38	4126	Cryptophyta	10663
Aphanothece sp.	87	277	Cyanobacteria	636
Aphanizomenon flos-aquae	1525	253919	Cyanobacteria	1191
Anacystis sp.	2652	5046	Cyanobacteria	609
Chlorogloea sp.	110	2469	Cyanobacteria	824
Chroococcus sp.	30	1005	Cyanobacteria	654
Anabaena sp.	4197	314688	Cyanobacteria	1100
Pseudanabaena sp.	292	3254	Cyanobacteria	1175
Snowella lacustris	68	746	Cyanobacteria	
Planktolyngbya sp.	99	1231	Cyanobacteria	
Aulacoseira distans var. nivalis	4	804	Diatom	590863
Cocconeis pediculus	4	6318	Diatom	3577
Gomphonema sp.	4	5508	Diatom	4911
Raphodia gibba	4	100531	Diatom	
Urosolenia sp.	15	94366	Diatom	590843
Tabellaria sp.	163	438108	Diatom	3241
Ulnaria sp.	11	12133	Diatom	970000
Trachelomonas sp.	11	38877	Euglenid	9690
Euglena sp.	11	6336	Euglenid	9620
Elakatothrix gelatinosa	11	1943	Green	9412
Gloeocystis sp.	11	1173	Green	6355
Mougeotia sp.	102	78718	Green	7055
Oocystis sp.	8	151	Green	5827
Oocystis parva	15	3372	Green	5827
microflagellate	220	37015	Other.Flagellates	

Figure 12: Raw data from 2021-08-18 EMS site 0400379

EMS ID: 1130618	Total Abundance (cells/mL):	5290		
Collection Date: 2021-08-18	Total Biovolume (µm³/mL):	2513970		
Report.Name	Abundance (cells/mL)	Biovolume (µm³/mL)	High.Level.Taxa	ITIS Genus Number
Dinobryon sp.	34	51068	Chrysophyta	1515
Mallomonas sp.	15	45365	Chrysophyta	1598
Ochromonas sp.	186	39817	Chrysophyta	1455
Chrysochromulina sp.	42	1615	Chrysophyta	2160
Chromulina sp.	23	40644	Chrysophyta	1717
Cryptomonas sp.	23	42597	Cryptophyta	10635
Cryptomonas curvata	4	25200	Cryptophyta	10635
Rhodomonas lacustris	46	4995	Cryptophyta	10663
Aphanizomenon flos-aquae	2011	334840	Cyanobacteria	1191
Anacystis sp.	1017	1935	Cyanobacteria	609
Anabaena sp.	854	64032	Cyanobacteria	1100
Dactylococcopsis sp.	8	545	Cyanobacteria	6446
Gomphosphaeria sp.	76	3372	Cyanobacteria	714
Snowella lacustris	323	3542	Cyanobacteria	
Synechococcales	72	12114	Cyanobacteria	
Aulacoseira italica	65	32448	Diatom	590863
Cocconeis pediculus	4	6318	Diatom	3577
Gomphonema sp.	4	5508	Diatom	4911
Nitzschia sp.	4	367	Diatom	5070
Urosolenia sp.	8	50328	Diatom	590843
Tabellaria sp.	137	368225	Diatom	3241
Ceratium sp.	8	1308997	Dinoflagellate	10397
Peridinium inconspicuum	4	7326	Dinoflagellate	10212
Elakatothrix gelatinosa	15	2649	Green	9412
Oocystis parva	15	3372	Green	5827
microflagellate	273	45932	Other.Flagellates	
Tribonema sp.	19	10819	Xanthophyta	2053

Figure 13: Raw data from 2021-08-18 EMS site 1130618

EMS ID: 400379	Total Abundance (cells/mL):	2616		
Collection Date: 2022-06-01	Total Biovolume ($\mu\text{m}^3/\text{mL}$):	1912574		
Report.Name	Abundance (cells/mL)	Biovolume ($\mu\text{m}^3/\text{mL}$)	High.Level.Taxa	ITIS Genus Number
Actinophryida	11	1851	Actinopoda	
Chrysococcus sp.	4	1328	Chrysophyta	1751
Chrysochromulina sp.	65	2500	Chrysophyta	2160
Chromulina sp.	34	60083	Chrysophyta	1717
Dinobryon divergens	140	120673	Chrysophyta	1515
Dinobryon bavaricum	190	413541	Chrysophyta	1515
Mallomonas hamata	15	43623	Chrysophyta	1598
Ochromonas sp.	83	17768	Chrysophyta	1455
Dinobryopsis sp.	19	5104	Chrysophyta	1557
Cryptomonas sp.	8	14816	Cryptophyta	10635
Cryptomonas curvata	11	69299	Cryptophyta	10635
Cryptomonas ovata	11	23935	Cryptophyta	10635
Cryptomonas erosa	57	100996	Cryptophyta	10635
Rhodomonas lacustris	83	9012	Cryptophyta	10663
Anabaena lemmermannii	258	69362	Cyanobacteria	1100
Anacystis incerta	57	125	Cyanobacteria	609
Planktothrix sp.	19	1058	Cyanobacteria	189420
Achnanthyidium sp.	11	2086	Diatom	590864
Asterionella formosa	459	319612	Diatom	3116
Amphora.sp	4	5833	Diatom	4705
Aulacoseira distans var. nivalis	114	22921	Diatom	590863
Aulacoseira granulata var. angustissima	46	24945	Diatom	590863
Aulacoseira granulata	137	45063	Diatom	590863
Aulacoseira ambigua	345	106740	Diatom	590863
Fragilaria sp.	8	3884	Diatom	2932
Lindavia sp.	4	3536	Diatom	
Navicula sp.	4	2827	Diatom	3649
Nitzschia acicularis	15	11843	Diatom	5070
Staurisira construens var. ventor	8	668	Diatom	4127
Stephanodiscus sp.	8	22902	Diatom	2415
Ulnaria ulna	4	21019	Diatom	970000
Gymnodinium helveticum	4	15811	Dinoflagellate	10031
Glenodinium sp.	4	7992	Dinoflagellate	10174
Strombomonas spp.	11	72772	Euglenid	9740
Trachelomonas volvocinopsis	4	13270	Euglenid	9690
Elakatothrix sp.	8	1536	Green	9412
Monoraphidium sp.	49	32463	Green	5990
Oocystis sp.	4	75	Green	5827
Closterium acutum	4	160836	Green	7257
Chlamydomonas sp.	23	13762	Green	5448
microflagellate	258	43408	Other.Flagellates	
Scourfieldia sp.	15	1696	Other.Flagellates	5561

Figure 14: Raw data from 2022-06-01 EMS site 0400379

EMS ID: 1130618	Total Abundance (cells/mL):	5155		
Collection Date: 2022-06-01	Total Biovolume ($\mu\text{m}^3/\text{mL}$):	2845591		
Report.Name	Abundance (cells/mL)	Biovolume ($\mu\text{m}^3/\text{mL}$)	High.Level.Taxa	ITIS Genus Number
Chrysochromulina sp.	30	1154	Chrysophyta	2160
Chromulina sp.	38	67152	Chrysophyta	1717
Dinobryon divergens	353	304268	Chrysophyta	1515
Dinobryon bavaricum	224	487543	Chrysophyta	1515
Mallomonas hamata	4	11633	Chrysophyta	1598
Ochromonas sp.	212	45383	Chrysophyta	1455
Dinobryopsis sp.	72	19340	Chrysophyta	1557
Cryptomonas sp.	72	133347	Cryptophyta	10635
Cryptomonas curvata	68	428396	Cryptophyta	10635
Cryptomonas ovata	11	23935	Cryptophyta	10635
Cryptomonas erosa	23	40753	Cryptophyta	10635
Rhodomonas lacustris	190	20630	Cryptophyta	10663
Anabaena sp.	357	26768	Cyanobacteria	1100
Anacystis sp.	839	1596	Cyanobacteria	609
Aphanocapsa sp.	76	240	Cyanobacteria	625
Spirulina major	121	2281	Cyanobacteria	1053
Asterionella formosa	721	502048	Diatom	3116
Aulacoseira granulata var. angustissima	167	90562	Diatom	590863
Aulacoseira granulata	167	54931	Diatom	590863
Aulacoseira ambigua	311	96221	Diatom	590863
Cocconeis pediculus	4	6318	Diatom	3577
Cyclotella sp.	4	1062	Diatom	2439
Fragilaria crotonensis	4	1942	Diatom	2932
Fragilaria sp.	8	3884	Diatom	2932
Meridion circulare	4	3344	Diatom	
Nitzschia acicularis	15	11843	Diatom	5070
Nitzschia palea	4	841	Diatom	5070
Tabellaria fenestrata	87	233837	Diatom	3241
Ulnaria ulna	4	21019	Diatom	970000
Ulnaria acus	4	4167	Diatom	970000
Parvodinium sp.	8	4411	Dinoflagellate	
Glenodinium sp.	11	21979	Dinoflagellate	10174
Trachelomonas volvocinopsis	4	13270	Euglenid	9690
Ankistrodesmus sp.	4	629	Green	5877
Chlamydomonas sp.	4	2393	Green	5448
microflagellate	930	156471	Other.Flagellates	

Figure 15: Raw data from 2022-06-01 EMS site 1130618

EMS ID: 1130618	Total Abundance (cells/mL):	8800			
Collection Date: 2022-08-23	Total Biovolume (µm³/mL):	857472			
Report.Name	Abundance (cells/mL)	Biovolume (µm³/mL)	High.Level.Taxa	ITIS Genus Number	kingdom
Actinophryida	15	2524	Actinopoda		
Chrysococcus sp.	19	6308	Chrysophyta	1751	Chromista
Chrysochromulina sp.	8	308	Chrysophyta	2160	Chromista
Dinobryon divergens	27	23273	Chrysophyta	1515	Chromista
Mallomonas hamata	15	43623	Chrysophyta	1598	Chromista
Mallomonas caudata	4	6568	Chrysophyta	1598	Chromista
Ochromonas sp.	137	29327	Chrysophyta	1455	Chromista
Dinobryopsis sp.	11	2955	Chrysophyta	1557	Chromista
Cryptomonas sp.	30	55561	Cryptophyta	10635	Chromista
Cryptomonas ovata	4	8704	Cryptophyta	10635	Chromista
Cryptomonas erosa	8	14175	Cryptophyta	10635	Chromista
Rhodomonas lacustris	209	22693	Cryptophyta	10663	Chromista
Anabaena sp.	95	7123	Cyanobacteria	1100	Bacteria
Anabaena planctonica	823	280938	Cyanobacteria	1100	Bacteria
Anabaena spiroides	137	36832	Cyanobacteria	1100	Bacteria
Anabaena affinis	76	21781	Cyanobacteria	1100	Bacteria
Anacystis sp.	1768	3364	Cyanobacteria	609	Bacteria
Anacystis incerta	220	481	Cyanobacteria	609	Bacteria
Anacystis limneticus	99	216	Cyanobacteria	609	Bacteria
Anacystis delicatissima	664	1450	Cyanobacteria	609	Bacteria
Aphanizomenon flos-aquae	304	50617	Cyanobacteria	1191	Bacteria
Aphanocapsa sp.	1434	4530	Cyanobacteria	625	Bacteria
Aphanothece sp.	114	364	Cyanobacteria	636	Bacteria
Chroococcus dispersus var. minor	8	113	Cyanobacteria	654	Bacteria
Snowella litoralis	292	13932	Cyanobacteria		
Synechocystis sp.	8	268	Cyanobacteria	799	Bacteria
Snowella lacustris	1696	18597	Cyanobacteria		
Woronichinia sp.	65	885	Cyanobacteria		
Achnanthyidium sp.	4	759	Diatom	590864	Chromista
Asterionella formosa	27	18801	Diatom	3116	Chromista
Aulacoseira granulata var. angustissima	15	8134	Diatom	590863	Chromista
Cocconeis pediculus	8	12636	Diatom	3577	Chromista
Fragilaria crotonensis	53	25735	Diatom	2932	Chromista
Frustulia sp.	4	6333	Diatom	4564	Chromista
Tabellaria fenestrata	4	10751	Diatom	3241	Chromista
Trachelomonas volvocinopsis	8	26541	Euglenid	9690	Protozoa
Euglena sp.	4	2304	Euglenid	9620	Protozoa
Monoraphidium sp.	15	9938	Green	5990	Plantae
Quadrigula chodati	102	29835	Green	5938	Plantae
Chlamydomonas sp.	8	4787	Green	5448	Plantae
microflagellate	258	43408	Other.Flagellates		

Figure 16: Raw data from 2022-08-23 EMS site 1130618

Report.Name	Abundance (cells/mL)	Biovolume (µm ³ /mL)	High.Level.Taxa	ITIS Genus Number
Actinophryida	4	673	Actinopoda	
Chroomonas sp.	4	909	Chrysophyta	10613
Chrysoococcus sp.	8	2656	Chrysophyta	1751
Chrysochromulina sp.	19	731	Chrysophyta	2160
Chromulina sp.	4	7069	Chrysophyta	1717
Dinobryon divergens	4	3448	Chrysophyta	1515
Dinobryon spp.	15	23797	Chrysophyta	1515
Mallomonas sp.	4	12097	Chrysophyta	1598
Mallomonas hamata	34	98879	Chrysophyta	1598
Ochromonas sp.	148	31682	Chrysophyta	1455
Dinobryopsis sp.	8	2149	Chrysophyta	1557
Cryptomonas sp.	34	62969	Cryptophyta	10635
Cryptomonas curvata	23	144899	Cryptophyta	10635
Cryptomonas ovata	15	32638	Cryptophyta	10635
Cryptomonas erosa	30	53156	Cryptophyta	10635
Rhodomonas lacustris	285	30945	Cryptophyta	10663
Anabaena sp.	186	13946	Cyanobacteria	1100
Anabaena planctonica	1469	501455	Cyanobacteria	1100
Anabaena spiroides	846	227444	Cyanobacteria	1100
Anabaena affinis	395	113206	Cyanobacteria	1100
Anacystis sp.	1214	2310	Cyanobacteria	609
Anacystis incerta	38	83	Cyanobacteria	609
Anacystis limneticus	61	133	Cyanobacteria	609
Anacystis delicatissima	1108	2420	Cyanobacteria	609
Aphanizomenon flos-aquae	1761	293214	Cyanobacteria	1191
Aphanocapsa sp.	311	983	Cyanobacteria	625
Aphanothece sp.	751	2395	Cyanobacteria	636
Gloeocapsa punctata	23	96	Cyanobacteria	682
Gloeocapsa aeruginosa	23	325	Cyanobacteria	682
Snowella litoralis	410	19562	Cyanobacteria	
Snowella lacustris	1081	11854	Cyanobacteria	
Pseudanabaena limnetica	11	1011	Cyanobacteria	1175
Planktolyngbya sp.	19	236	Cyanobacteria	
Asterionella formosa	76	52920	Diatom	3116
Aulacoseira distans var. nivalis	8	1608	Diatom	590863
Aulacoseira granulata var. angustissima	148	80259	Diatom	590863
Aulacoseira granulata	99	32564	Diatom	590863
Cocconeis pediculus	4	6318	Diatom	3577
Lindavia bodanica	8	8348	Diatom	
Nitzschia actinastroides	15	5922	Diatom	5070
Nitzschia palea	15	3153	Diatom	5070
Stephanodiscus sp.	4	11451	Diatom	2415
Ulnaria ulna	4	21019	Diatom	970000
Ulnaria acus	4	4167	Diatom	970000
Urosolenia eriensis	4	9040	Diatom	590843
Ceratium hirundinella	11	1899192	Dinoflagellate	10397
Gymnodinium ordinarum	8	15599	Dinoflagellate	10031
Gymnodinium uliginosa	11	43480	Dinoflagellate	10031
Parvodinium sp.	8	4411	Dinoflagellate	
Trachelomonas volvocinopsis	4	13270	Euglenid	9690
Trachelomonas hispida	4	13270	Euglenid	9690
Asterococcus sp.	4	4601	Green	9178
Monoraphidium sp.	8	5300	Green	5990
Chlamydomonas sp.	15	8975	Green	5448
microflagellate	562	94555	Other.Flagellates	

Figure 17: Raw data from 2022-08-23 EMS site 0400379