

Osoyoos Lake Phytoplankton Summary Report 2021-2022

Overview

Samples were collected from three sites on Osoyoos Lake during 2021 and 2022 (Figure 1; Table 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
OSOYOOS L OPP. MONASHEE CO-OP (0500728)	2021-03-15
	2021-09-14
	2022-04-04
	2022-09-20
OSOYOOS LAKE CENTRAL BASIN (E220540)	2021-09-14
	2022-04-04
	2022-09-20
OSOYOOS L SOUTH BASIN (0500248)	2021-09-14
	2022-04-04
	2022-09-20
Total = 10 samples	

Two of three spring samples demonstrated elevated concentrations of diatoms relative to summer samples (site # 0500248 and # 0500728). Dominant diatom genera included *Aulacoseira* and *Asterionella*. Spring blooms of diatoms are common and reflective of increased temperatures, light penetration, and silica in the water following ice thaw (Kong et al., 2021). Diatoms increase the resiliency and health of water systems through their ability to bloom in early spring, reduce nutrient levels, and prevent monoculture blooms of less desirable algae (jrobyn, 2019). Spring samples also demonstrated some diatom degradation, indicative of lowering silica levels in the late spring (Figure 2).

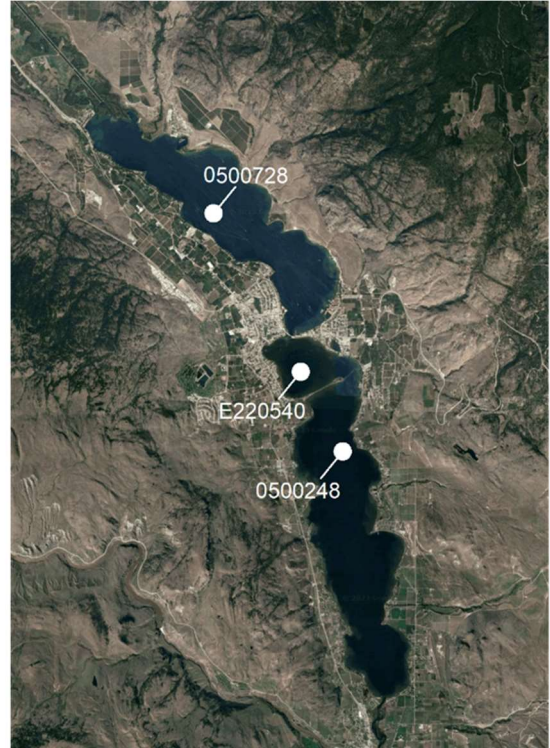


Figure 1: Aerial view of Osoyoos Lake

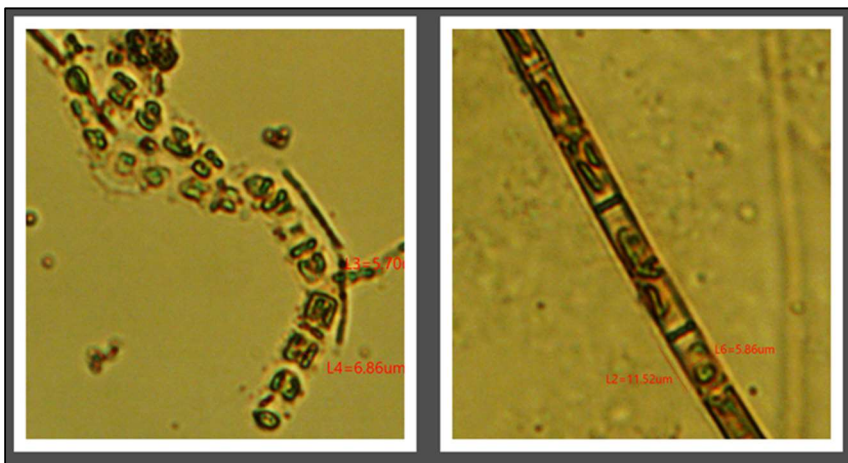


Figure 2: Degraded spring (left) vs. intact summer (right) *Aulacoseira* species

Overview (continued)

Samples from site 0500728 contained elevated densities of Chromalinales from genus *Dinobryon* on 2022-09-20 (Figure 3). *Dinobryon* blooms are associated with unpleasant fishy odors, and one species of *Dinobryon* is linked with toxins that can affect fish vitality (Cantrell & Long, 2013; Conrad, 2013).

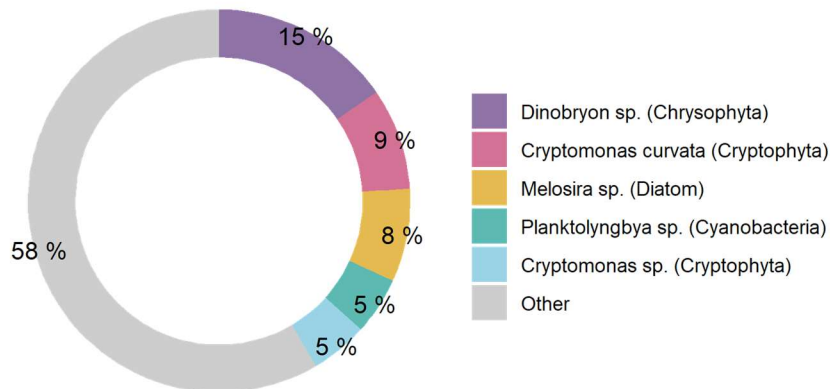


Figure 3: Dominant organisms from Osoyoos Lake (all sites / dates) as percent of total biovolume

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 (Figure 3). This is highlighted in Figure 4 where a single *Dinobryon* is an equivalent size to approximately 100 cyanobacteria cells (*Planktolyngbya*).



Figure 4: Size comparison of a single *Dinobryon* cell (circled) to a strand of filamentous cyanobacteria *Planktolyngbya* (arrow): approximately 125 cells

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

Samples demonstrated high densities of cyanobacteria, dominant genera included *Planktolyngbya*, *Anacystis*, and *Planktothrix* (Figure 5).

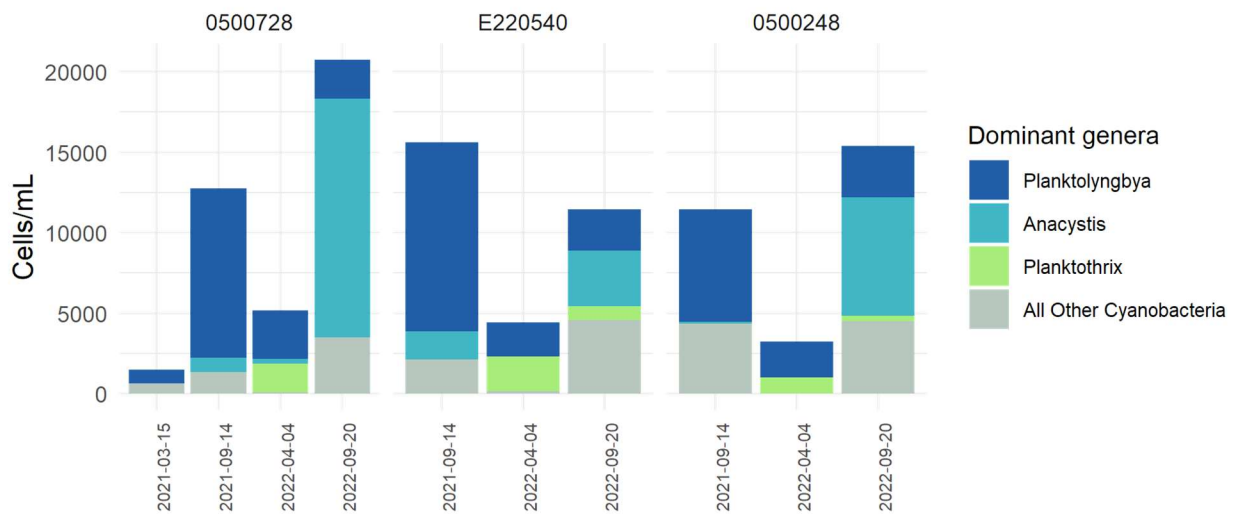


Figure 5: cell abundance for dominant cyanobacteria genera on Osoyoos Lake

During blooms, species of *Planktothrix* produce both negative odor/taste compounds and toxic secondary metabolites. *Planktothrix* blooms form dense surface scums associated with strong earthy odors (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 Osoyoos Lake and their associated toxins

Genus	Maximum Abundance* (cells/mL)	Toxins Produced
<i>Planktolyngbya</i>	11744	Lyngbyatoxin LYN, Microcystin MC, BMAA
<i>Anacystis</i>	14818	Lyngbyatoxin LYN, Lipopolysaccharide LPS, Microcystin MC, Nodularins NOD, Anatoxins (-a) ATX, BMAA, Cyanopeptolins CPL, Anabaenopeptins APT
<i>Planktothrix</i>	2174	Lyngbyatoxin LYN, Aplysiatoxins APL, Lipopolysaccharide LPS, Microcystin MC, Anatoxins (-a) ATX, Saxitoxins SAX neosaxitoxin NEO, BMAA, Cyanopeptolins CPL, Anabaenopeptins APT, Taste and Odor

Note: * = counted in samples

Cyanobacterial Presence (Continued)

Dominant species of cyanobacteria identified in Osoyoos Lake can produce cyanotoxins (Table 2).

Osoyoos Lake displayed a range of cyanobacteria levels in the negligible to moderate risk categories, with a mean cyanobacteria abundance of 10,176 cells/mL (Figure 6). Figure 6 exhibits the range of cyanobacterial abundance observed in Osoyoos Lake compared to alert levels defined by authorities including the WHO and EPA.

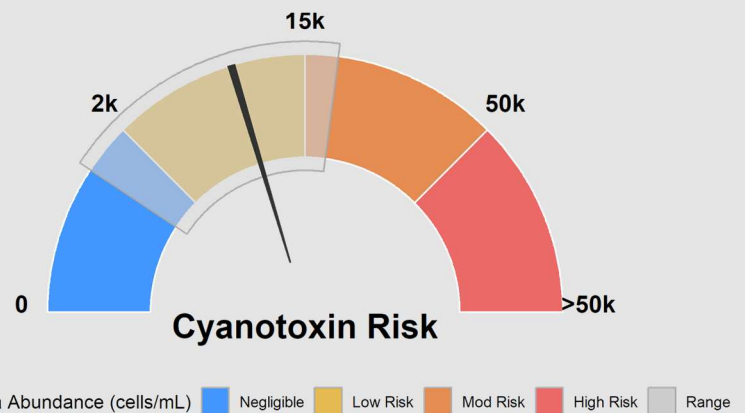


Figure 6: Cyanotoxin risk posed by cyanobacteria blooms in Osoyoos Lake

Summer samples contained amorphous films of degraded cyanobacteria and bacteria (Figure 7). Degraded cyanobacteria could represent threats to public health as cyanotoxins are usually contained within the cyanobacterial cells before cell death (EPA, 2022).

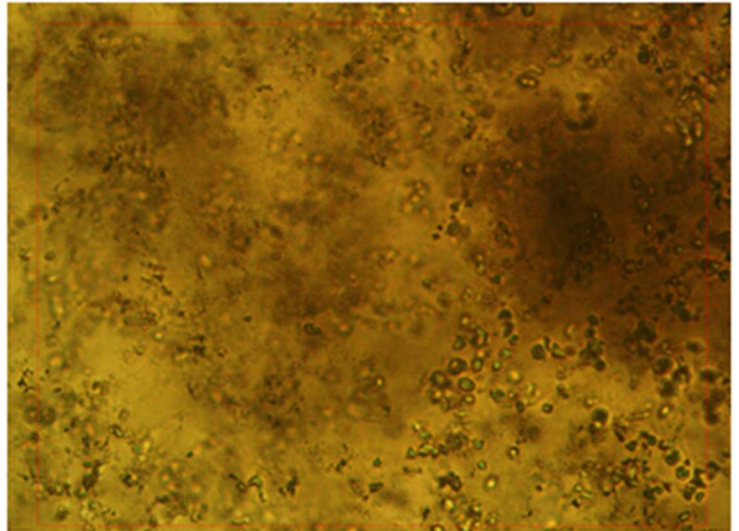
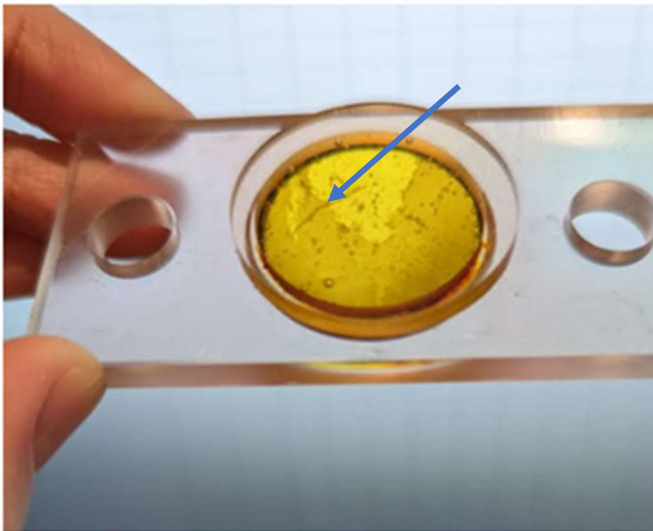


Figure 7: Amorphous film of degraded cyanobacteria and bacteria on the Utermohl slide (blue arrow points to film edge) and microscopic view of film at 400x magnification

Species Composition

Algae samples were identified to the genus level and grouped into broad algae types for analysis. The figures below display 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.

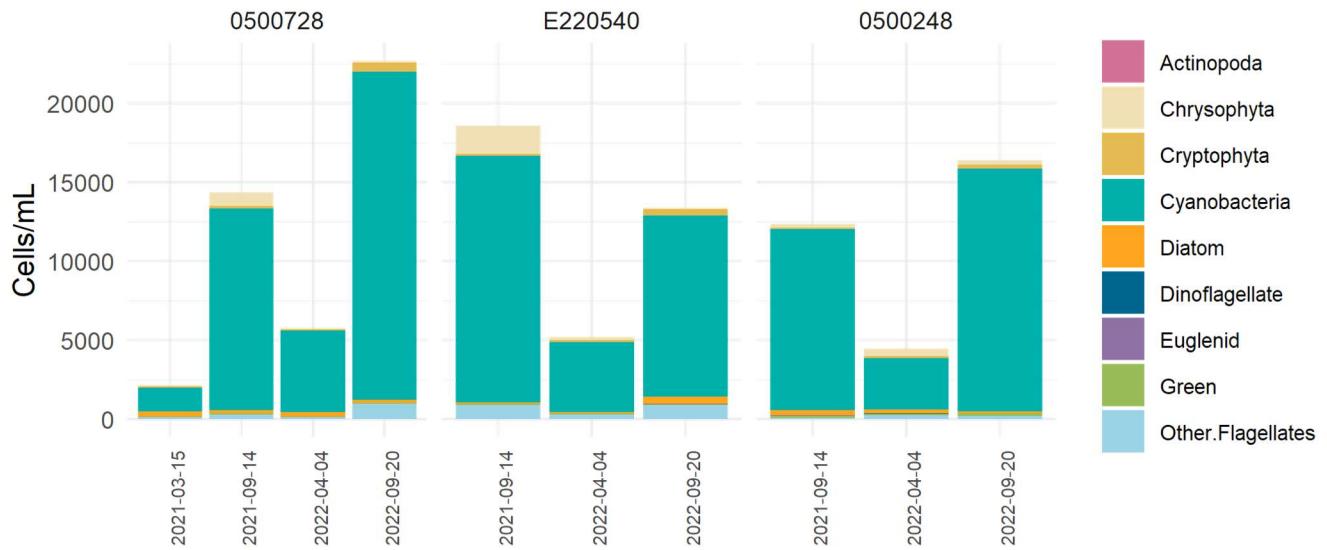


Figure 8: Cell abundance of high-level taxa groups on Osoyoos Lake

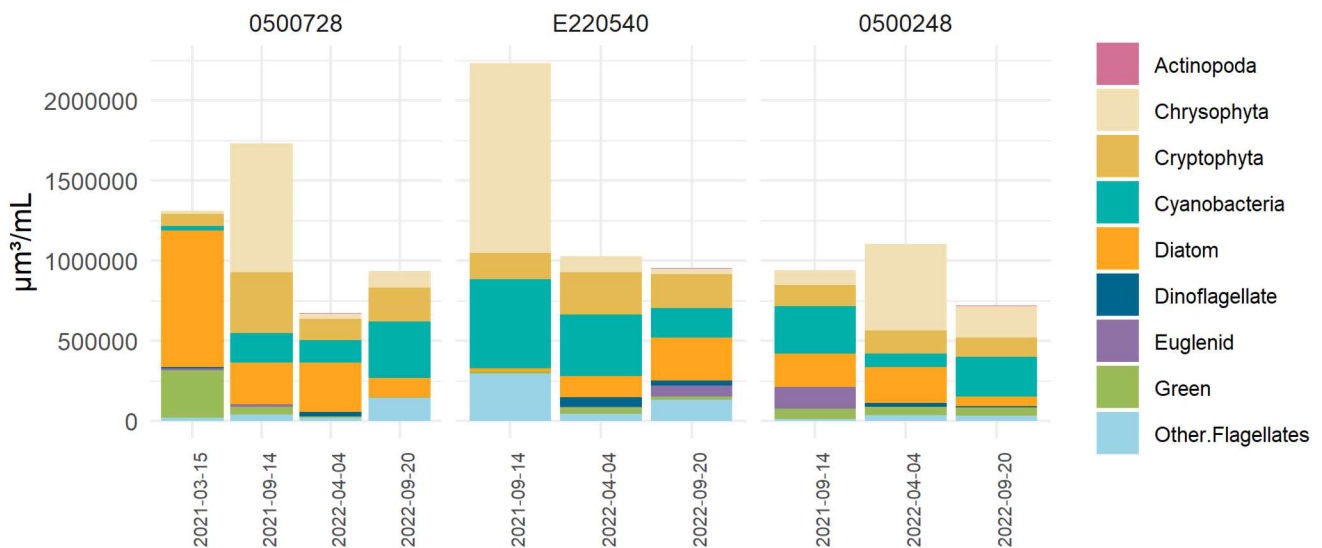


Figure 9: Biovolume of high-level taxa groups on Osoyoos Lake

References

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Appendix

Additional figures and raw data are listed below:

108 species identified at Osoyoos.

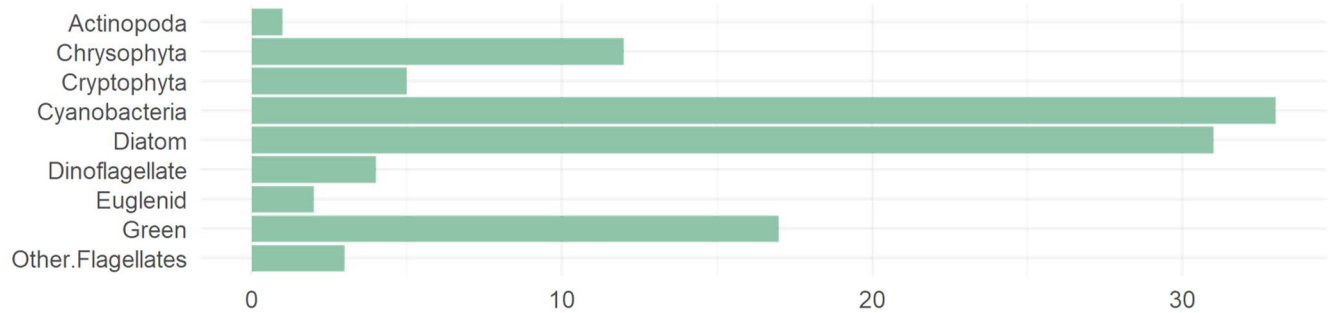


Figure 10: Identified species sorted into categories of higher-level taxa

Report.Name	Abundance (cells/mL)	Biovolume ($\mu\text{m}^3/\text{mL}$)	High.Level.Taxa	ITIS Genus Number
Ochromonas sp.	72	15413	Chrysophyta	1455
Chrysococcus sp.	11	3652	Chrysophyta	1751
Dinobryopsis sp.	8	2149	Chrysophyta	1557
Cryptomonas curvata	11	69299	Cryptophyta	10635
Rhodomonas lacustris	80	8686	Cryptophyta	10663
Aphanizomenon sp.	121	4276	Cyanobacteria	1191
Chroococcus sp.	23	771	Cyanobacteria	654
Anabaena sp.	15	1125	Cyanobacteria	1100
Planktolyngbya sp.	839	10429	Cyanobacteria	
Oscillatoria tenuis	379	3393	Cyanobacteria	917
Pseudanabaena limnetica	65	5973	Cyanobacteria	1175
Spirulina major	46	289	Cyanobacteria	1053
Nitzschia sp.	15	1375	Diatom	5070
Melosira sp.	220	718840	Diatom	2290
Stephanodiscus niagarae	4	42005	Diatom	2415
Tabellaria sp.	23	61819	Diatom	3241
Staurosira sp.	61	28171	Diatom	590848
Gymnodinium sp.	4	8474	Dinoflagellate	10031
Trachelomonas sp.	4	14137	Euglenid	9690
Monoraphidium indicum	30	19875	Green	5990
Closterium sp.	15	277067	Green	7257
UID flagellate	8	2783	Other.Flagellates	
microflagellate	110	18507	Other.Flagellates	

Figure 11: Raw data from 2021-03-15 EMS site 0500728

EMS ID: 0500728	Total Abundance (cells/mL):	14344		
Collection Date: 2021-09-14	Total Biovolume ($\mu\text{m}^3/\text{mL}$):	1745686		
Report.Name	Abundance (cells/mL)	Biovolume ($\mu\text{m}^3/\text{mL}$)	High.Level.Taxa	ITIS Genus Number
Dinobryon sp.	478	717956	Chrysophyta	1515
Ochromonas sp.	315	67432	Chrysophyta	1455
Chrysococcus sp.	65	21582	Chrysophyta	1751
Dinobryopsis sp.	19	5104	Chrysophyta	1557
Cryptomonas sp.	19	35189	Cryptophyta	10635
Cryptomonas curvata	46	289797	Cryptophyta	10635
Cryptomonas ovata	23	50045	Cryptophyta	10635
Rhodomonas lacustris	49	5320	Cryptophyta	10663
Aphanocapsa delicatissima	129	540	Cyanobacteria	625
Anacystis sp.	880	1674	Cyanobacteria	609
Cuspidothrix sp.	57	4057	Cyanobacteria	
Chroococcus sp.	30	1005	Cyanobacteria	654
Anabaena helicoidea	266	35098	Cyanobacteria	1100
Gloeotheca sp.	15	982	Cyanobacteria	703
Planktolyngbya sp.	10541	131025	Cyanobacteria	
Limnothrix sp.	23	325	Cyanobacteria	
Merismopedia punctata	273	1766	Cyanobacteria	727
Oscillatoria tenuis	531	4754	Cyanobacteria	917
Pseudanabaena limnetica	23	2114	Cyanobacteria	1175
Achnanthydium minutissimum	15	2845	Diatom	590864
Aulacoseira italica	15	7488	Diatom	590863
Aulacoseira granulata	30	9868	Diatom	590863
Cyclotella sp.	4	1062	Diatom	2439
Cymbella sp.	4	6773	Diatom	4795
Fragilaria crotonensis	61	29619	Diatom	2932
Nitzschia sp.	15	1375	Diatom	5070
Melosira sp.	30	98024	Diatom	2290
Stephanodiscus niagarae	4	42005	Diatom	2415
Stauroneis kootenai	4	42625	Diatom	4127
Synedra tabulata	8	19440	Diatom	3013
Trachelomonas sp.	4	14137	Euglenid	9690
Mougeotia sp.	57	43989	Green	7055
Tetrastrum sp.	30	3393	Green	6260
microflagellate	281	47278	Other.Flagellates	

Figure 12: Raw data from 2021-09-14 EMS site 0500728

EMS ID: E220540	Total Abundance (cells/mL):	18594		
Collection Date: 2021-09-14	Total Biovolume ($\mu\text{m}^3/\text{mL}$):	2248686		
Report.Name	Abundance (cells/mL)	Biovolume ($\mu\text{m}^3/\text{mL}$)	High.Level.Taxa	ITIS Genus Number
Dinobryon sp.	683	1025866	Chrysophyta	1515
Ochromonas sp.	664	142142	Chrysophyta	1455
Chrysochromulina sp.	436	16770	Chrysophyta	2160
Dinobryopsis sp.	57	15311	Chrysophyta	1557
Cryptomonas sp.	19	35189	Cryptophyta	10635
Cryptomonas curvata	19	119699	Cryptophyta	10635
Rhodomonas lacustris	95	10315	Cryptophyta	10663
Aphanocapsa delicatissima	379	1588	Cyanobacteria	625
Anacystis sp.	1442	2744	Cyanobacteria	609
Anacystis pulchra	76	166	Cyanobacteria	609
Anacystis limneticus	228	498	Cyanobacteria	609
Anabaena affinis	683	195747	Cyanobacteria	1100
Aphanizomenon flos-aquae var. klebahnii	797	205524	Cyanobacteria	1191
Pseudanabaena sp.	190	2117	Cyanobacteria	1175
Planktolyngbya sp.	11744	145978	Cyanobacteria	
Merismopedia punctata	76	492	Cyanobacteria	727
Achnanthydium minutissimum	38	7208	Diatom	590864
Aulacoseira granulata	19	6250	Diatom	590863
Cyclotella sp.	19	5044	Diatom	2439
Nitzschia sp.	19	1742	Diatom	5070
Ankistrodesmus falcatus	19	2686	Green	5877
Oocystis parva	38	8542	Green	5827
UID flagellate	854	297068	Other.Flagellates	

Figure 13: Raw data from 2021-09-14 EMS site E220540

EMS ID: 0500248	Total Abundance (cells/mL):	12361		
Collection Date: 2021-09-14	Total Biovolume ($\mu\text{m}^3/\text{mL}$):	943709		
Report.Name	Abundance (cells/mL)	Biovolume ($\mu\text{m}^3/\text{mL}$)	High.Level.Taxa	ITIS Genus Number
Dinobryon sp.	30	45060	Chrysophyta	1515
Chrysococcus sp.	11	3652	Chrysophyta	1751
Ochromonas sp.	194	41529	Chrysophyta	1455
Dinobryopsis sp.	8	2149	Chrysophyta	1557
Cryptomonas sp.	19	35189	Cryptophyta	10635
Cryptomonas curvata	11	69299	Cryptophyta	10635
Cryptomonas ovata	11	23935	Cryptophyta	10635
Rhodomonas lacustris	46	4995	Cryptophyta	10663
Aphanizomenon sp.	1916	67717	Cyanobacteria	1191
Aphanizomenon flos-aquae	53	8825	Cyanobacteria	1191
Anacystis sp.	102	194	Cyanobacteria	609
Cuspidothrix sp.	1081	76942	Cyanobacteria	
Anabaena planctonica	30	10241	Cyanobacteria	1100
Anabaena sp.	478	35840	Cyanobacteria	1100
Pseudanabaena sp.	592	6596	Cyanobacteria	1175
Planktolyngbya sp.	6978	86737	Cyanobacteria	
Oscillatoria tenuis	212	1898	Cyanobacteria	917
Aulacoseira ambigua	190	58784	Diatom	590863
Aulacoseira granulata	91	29932	Diatom	590863
Cyclotella sp.	4	1062	Diatom	2439
Fragilaria crotonensis	38	18451	Diatom	2932
Navicula spp.	4	2356	Diatom	3649
Nitzschia sp.	8	734	Diatom	5070
Melosira sp.	30	98024	Diatom	2290
Trachelomonas sp.	38	134303	Euglenid	9690
Gloeocystis sp.	15	1599	Green	6355
Mougeotia sp.	83	64055	Green	7055
Oocystis sp.	8	151	Green	5827
microflagellate	80	13460	Other.Flagellates	

Figure 14: Raw data from 2021-09-14 EMS site 0500248

EMS ID: 0500248	Total Abundance (cells/mL):	4496		
Collection Date: 2022-04-04	Total Biovolume ($\mu\text{m}^3/\text{mL}$):	1109719		
Report.Name	Abundance (cells/mL)	Biovolume ($\mu\text{m}^3/\text{mL}$)	High.Level.Taxa	ITIS Genus Number
Chrysochromulina sp.	19	731	Chrysophyta	2160
Chromulina sp.	8	14137	Chrysophyta	1717
Dinobryon spp.	239	379166	Chrysophyta	1515
Mallomonas sp.	34	102826	Chrysophyta	1598
Rhodomonas sp.	42	4787	Chrysophyta	10663
Ochromonas sp.	163	34893	Chrysophyta	1455
Dinobryopsis sp.	15	4029	Chrysophyta	1557
Cryptomonas sp.	30	55561	Cryptophyta	10635
Cryptomonas curvata	8	50400	Cryptophyta	10635
Cryptomonas ovata	11	23935	Cryptophyta	10635
Cryptomonas erosa	4	7087	Cryptophyta	10635
Rhodomonas lacustris	34	3692	Cryptophyta	10663
Planktolyngbya sp.	2227	27682	Cyanobacteria	
Planktothrix sp.	1028	57224	Cyanobacteria	189420
Asterionella formosa	231	160850	Diatom	3116
Aulacoseira sp.	38	62533	Diatom	590863
Cymbellales	4	673	Diatom	
Gymnodinium helveticum	4	15811	Dinoflagellate	10031
Glenodinium sp.	4	7992	Dinoflagellate	10174
Ankistrodesmus sp.	11	1729	Green	5877
Elakatothrix sp.	4	768	Green	9412
Monoraphidium indicum	49	32463	Green	5990
Monoraphidium sp.	8	5300	Green	5990
Chlamydomonas sp.	19	11369	Green	5448
microflagellate	262	44081	Other.Flagellates	

Figure 15: Raw data from 2021-04-04 EMS site 0500248

EMS ID: 0500248	Total Abundance (cells/mL):	17036		
Collection Date: 2022-09-20	Total Biovolume (µm³/mL):	767877		
Report.Name	Abundance (cells/mL)	Biovolume (µm³/mL)	High.Level.Taxa	ITIS Genus Number
Actinophryida	8	1346	Actinopoda	
Chrysococcus sp.	8	2656	Chrysophyta	1751
Chrysochromulina sp.	144	5539	Chrysophyta	2160
Chromulina sp.	27	47713	Chrysophyta	1717
Dinobryon bavaricum	38	82708	Chrysophyta	1515
Dinobryon spp.	23	36489	Chrysophyta	1515
Mallomonas caudata	11	18062	Chrysophyta	1598
Dinobryopsis sp.	11	2955	Chrysophyta	1557
Rhodomonas sp.	4	456	Chrysophyta	10663
Spumella sp.	19	139	Chrysophyta	1491
Cryptomonas sp.	46	85194	Cryptophyta	10635
Cryptomonas ovata	8	17407	Cryptophyta	10635
Rhodomonas lacustris	171	18567	Cryptophyta	10663
Anabaena sp.	391	29317	Cyanobacteria	1100
Dolichospermum heterosp	144	20706	Cyanobacteria	
Anabaena affinis	76	21781	Cyanobacteria	1100
Anabaena helicoidea	292	38528	Cyanobacteria	1100
Anacystis sp.	2091	3979	Cyanobacteria	609
Anacystis delicatissima	5271	1154	Cyanobacteria	609
Aphanizomenon sp.	565	19969	Cyanobacteria	1191
Aphanocapsa delicatissima	1434	6007	Cyanobacteria	625
Cuspidothrix sp.	497	20664	Cyanobacteria	
Limnothrix sp.	30	424	Cyanobacteria	
Lyngbya birgei	121	113	Cyanobacteria	870
Synechocystis sp.	8	268	Cyanobacteria	799
Snowella sp.	182	781	Cyanobacteria	
Pseudanabaena sp.	1389	15476	Cyanobacteria	1175
Planktolyngbya sp.	3176	39478	Cyanobacteria	
Planktothrix agardhii	353	57702	Cyanobacteria	189420
Aulacoseira granulata	72	23683	Diatom	590863
Cymbellales	8	1346	Diatom	
Fragilaria capucina	4	1942	Diatom	2932
Fragilaria tenera	4	1942	Diatom	2932
Stephanodiscus sp.	4	11451	Diatom	2415
Ulnaria acus	19	19795	Diatom	970000
Gymnodinium sp.	4	8474	Dinoflagellate	10031
Parvodinium sp.	4	2205	Dinoflagellate	
Sphaerocystis sp.	34	7356	Green	9169
Elakatothrix sp.	19	3648	Green	9412
Mougeotia sp.	8	6174	Green	7055
Monoraphidium sp.	19	12588	Green	5990
Oocystis sp.	8	151	Green	5827
Oocystis borgei	15	9503	Green	5827
Quadrigula chodati	30	8775	Green	5938
Didymocystis bicellularis	15	4041	Green	55858
microflagellate	231	38865	Other.Flagellates	

Figure 16: Raw data from 2022-09-20 EMS site 0500248

EMS ID: E220540	Total Abundance (cells/mL):	13379		
Collection Date: 2022-09-20	Total Biovolume ($\mu\text{m}^3/\text{mL}$):	972959		
Report.Name	Abundance (cells/mL)	Biovolume ($\mu\text{m}^3/\text{mL}$)	High.Level.Taxa	ITIS Genus Number
Actinophryida	19	3197	Actinopoda	
Chrysochromulina sp.	38	1462	Chrysophyta	2160
Chromulina sp.	19	33576	Chrysophyta	1717
Cryptomonas sp.	95	175944	Cryptophyta	10635
Rhodomonas lacustris	304	33008	Cryptophyta	10663
Anabaena sp.	379	28417	Cyanobacteria	1100
Anabaena planctonica	38	12972	Cyanobacteria	1100
Anacystis sp.	3453	6570	Cyanobacteria	609
Aphanizomenon sp.	323	11416	Cyanobacteria	1191
Aphanocapsa elachista var. planctonica	835	6831	Cyanobacteria	625
Chroococcus sp.	304	10187	Cyanobacteria	654
Gloeocapsa punctata	266	1114	Cyanobacteria	682
Gloeocapsa aeruginosa	95	1343	Cyanobacteria	682
Gloeothece sp.	38	2487	Cyanobacteria	703
Pseudanabaena sp.	2296	25582	Cyanobacteria	1175
Planktolyngbya sp.	2580	32069	Cyanobacteria	
Planktothrix sp.	854	47538	Cyanobacteria	189420
Achnantheidium sp.	19	3604	Diatom	590864
Asterionella formosa	38	26460	Diatom	3116
Aulacoseira granulata	38	12499	Diatom	590863
Cocconeis sp.	38	53721	Diatom	3577
Cyclotella sp.	19	5044	Diatom	2439
Fragilaria crotonensis	247	119933	Diatom	2932
Fragilaria tenera	38	18451	Diatom	2932
Gomphonema sp.	19	26165	Diatom	4911
Peridinium inconspicuum	19	34797	Dinoflagellate	10212
Trachelomonas sp.	19	67152	Euglenid	9690
Monoraphidium sp.	19	12588	Green	5990
Oocystis solitaria	38	8755	Green	5827
microflagellate	892	150077	Other.Flagellates	

Figure 17: Raw data from 2022-09-20 EMS site E220540

EMS ID: E220540	Total Abundance (cells/mL):	5226		
Collection Date: 2022-04-04	Total Biovolume ($\mu\text{m}^3/\text{mL}$):	1051495		
Report.Name	Abundance (cells/mL)	Biovolume ($\mu\text{m}^3/\text{mL}$)	High.Level.Taxa	ITIS Genus Number
Actinophryida	4	673	Actinopoda	
Chrysochromulina sp.	30	1154	Chrysophyta	2160
Chromulina sp.	15	26507	Chrysophyta	1717
Dinobryon spp.	34	53940	Chrysophyta	1515
Rhodomonas sp.	110	12536	Chrysophyta	10663
Dinobryopsis sp.	15	4029	Chrysophyta	1557
Cryptomonas sp.	38	70378	Cryptophyta	10635
Cryptomonas curvata	30	188998	Cryptophyta	10635
Rhodomonas lacustris	38	4126	Cryptophyta	10663
Aphanizomenon sp.	102	3605	Cyanobacteria	1191
Planktolyngbya sp.	2095	26041	Cyanobacteria	
Planktothrix agardhii	2174	355364	Cyanobacteria	189420
Phormidium sp.	46	1982	Cyanobacteria	992
Asterionella formosa	8	5571	Diatom	3116
Aulacoseira sp.	42	69115	Diatom	590863
Gomphonema sp.	4	5508	Diatom	4911
Neidium sp.	4	5388	Diatom	3269
Nitzschia spp.	4	1579	Diatom	5070
Stephanodiscus sp.	8	22902	Diatom	2415
Tabellaria fenestrata	8	21502	Diatom	3241
Gymnodinium helveticum	11	43480	Dinoflagellate	10031
Parvodinium sp.	30	16540	Dinoflagellate	
Glenodinium sp.	8	15984	Dinoflagellate	10174
Euglena sp.	4	2304	Euglenid	9620
Elakatothrix sp.	8	1536	Green	9412
Mougeotia sp.	11	8489	Green	7055
Monoraphidium indicum	49	32463	Green	5990
microflagellate	296	49801	Other.Flagellates	

Figure 18: Raw data from 2022-04-04 EMS site E220540

EMS ID: 0500728	Total Abundance (cells/mL):	5870		
Collection Date: 2022-04-04	Total Biovolume ($\mu\text{m}^3/\text{mL}$):	676378		
Report.Name	Abundance (cells/mL)	Biovolume ($\mu\text{m}^3/\text{mL}$)	High.Level.Taxa	ITIS Genus Number
Actinophryida	4	673	Actinopoda	
Chrysochromulina sp.	11	423	Chrysophyta	2160
Chromulina sp.	4	7069	Chrysophyta	1717
Dinobryon spp.	4	6346	Chrysophyta	1515
Mallomonas sp.	4	12097	Chrysophyta	1598
Rhodomonas sp.	57	6496	Chrysophyta	10663
Cryptomonas sp.	19	35189	Cryptophyta	10635
Cryptomonas curvata	15	94499	Cryptophyta	10635
Rhodomonas lacustris	49	5320	Cryptophyta	10663
Anacystis sp.	330	628	Cyanobacteria	609
Aphanothece sp.	76	242	Cyanobacteria	636
Spirulina major	91	1715	Cyanobacteria	1053
Planktolyngbya sp.	2994	37215	Cyanobacteria	
Planktothrix sp.	1776	98861	Cyanobacteria	189420
Aulacoseira sp.	72	118484	Diatom	590863
Aulacoseira granulata	129	42432	Diatom	590863
Lindavia intermedia	4	3536	Diatom	
Nitzschia spp.	4	1579	Diatom	5070
Stephanodiscus sp.	4	11451	Diatom	2415
Tabellaria fenestrata	49	131701	Diatom	3241
Glenodinium sp.	4	7992	Dinoflagellate	10174
Peridinium inconspicuum	11	20146	Dinoflagellate	10212
Elakatothrix sp.	4	768	Green	9412
Monoraphidium indicum	11	7288	Green	5990
microflagellate	144	24228	Other.Flagellates	

Figure 19: Raw data from 2022-04-04 EMS site 0500728

EMS ID: 0500728	Total Abundance (cells/mL):	23225		
Collection Date: 2022-09-20	Total Biovolume ($\mu\text{m}^3/\text{mL}$):	966397		
Report.Name	Abundance (cells/mL)	Biovolume ($\mu\text{m}^3/\text{mL}$)	High.Level.Taxa	ITIS Genus Number
Chrysochromulina sp.	76	2923	Chrysophyta	2160
Chromulina sp.	57	100727	Chrysophyta	1717
Cryptomonas sp.	19	35189	Cryptophyta	10635
Cryptomonas curvata	19	119699	Cryptophyta	10635
Rhodomonas lacustris	531	57655	Cryptophyta	10663
Anabaena sp.	740	55485	Cyanobacteria	1100
Anabaena helicoidea	1518	200295	Cyanobacteria	1100
Anacystis sp.	14818	28196	Cyanobacteria	609
Aphanizomenon sp.	854	30183	Cyanobacteria	1191
Gomphosphaeria sp.	76	3372	Cyanobacteria	714
Pseudanabaena sp.	323	3599	Cyanobacteria	1175
Planktolyngbya sp.	2429	30193	Cyanobacteria	
Achnanthydium sp.	38	7208	Diatom	590864
Aulacoseira granulata	76	24998	Diatom	590863
Aulacoseira granulata var. angustissima	38	20607	Diatom	590863
Lindavia intermedia	19	16795	Diatom	
Navicula sp.	19	13430	Diatom	3649
Ulnaria acus	38	39589	Diatom	970000
Ankistrodesmus falcatus	19	2686	Green	5877
Coenococcus sp.	531	7507	Green	
microflagellate	987	166061	Other.Flagellates	

Figure 20: Raw data from 2022-09-20 EMS site 0500728