Lake Bonaparte Questions and Answers, 2015 CSLAP

Q1. What is the condition of our lake this year?

A1. Water quality conditions in Lake Bonaparte were probably close to normal- water clarity and algae levels were slightly lower, while phosphorus readings were similar to the long-term average for the lake. No shoreline algae blooms were reported, and recreational conditions continue to be good to excellent.

Q2. Is there anything new that showed up in the testing this year?

A2. Chloride testing results were typical of lakes with low to no impacts from road salt runoff, and no biological impacts were measured or reported.

Q3. How does the condition of our lake this year compare with other lakes in the area?

A3. Lake Bonaparte had higher water clarity, and lower nutrient and algae levels, than the typical lake in the area. Aquatic plant coverage continues to be slightly higher than in these other lakes, although this does not appear to have much of an impact on recreational use of the lake.

Q4. Are there any trends in our lake's condition?

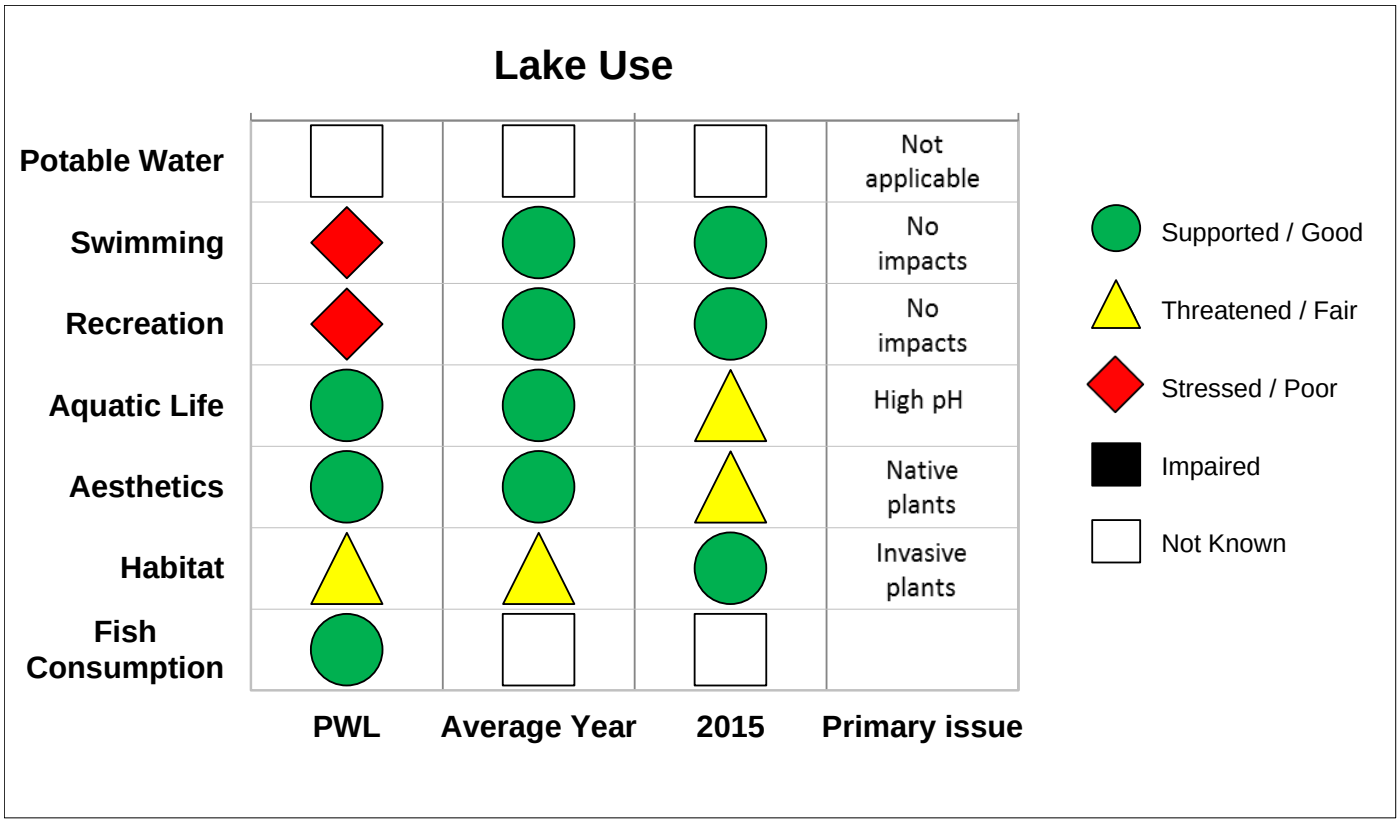
A4. Water clarity decreased from the early 2000s to 2015, consistent with an increase in nutrient levels over much of that timeframe. However, water quality and recreational assessments were consistently good over this period. pH has increased over the last fifteen years, but no biological impacts were apparent.

Q5. Should we be concerned about the condition of our lake? Are we close to a tipping point?

A5. Lake Bonaparte does not appear to be susceptible to shoreline algae blooms, based on low nutrient levels, and no blooms have been reported in at least the last few years. The lake association should determine if any external sources of nutrient lead to the slight increase in phosphorus readings over the last 10 to 15 years.

Q6. Are any actions indicated, based on the trends and this year's results?

A6. Individual stewardship activities such as pumping your septic system, growing a buffer of native plants next to the water bodies, and reducing erosion from shoreline properties and runoff into the lake will help to maintain lake health by reducing nutrient and sediment loading to the lake. Visiting boats should be inspected to reduce the risk of new invasive species, since nearby lakes harbor several invasive plants not presently found in the lake.

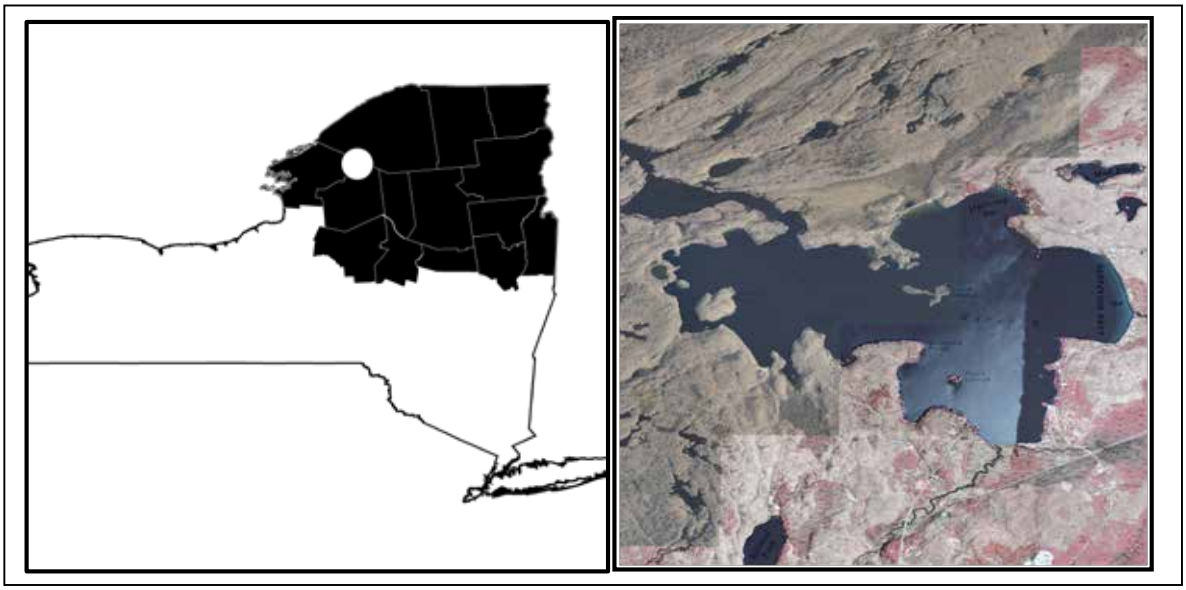


CSLAP 2015 Lake Water Quality Summary:
Lake Bonaparte

General Lake Information

Location	Town of Harrisville
County	Lewis
Basin	St. Lawrence River
Size	521 hectares (1,286 acres)
Lake Origins	Natural
Watershed Area	4,770 hectares (11,782 acres)
Retention Time	1.8 years
Mean Depth	9.4 meters
Sounding Depth	22 meters
Public Access?	DEC launch
Major Tributaries	Clark Creek, Dobson Creek
Lake Tributary To…	Bonaparte Creek to Indian River to Black Lake to Oswegatchie River to St. Lawrence River
WQ Classification	B (contact recreation = swimming)
Lake Outlet Latitude	44.158
Lake Outlet Longitude	-75.404
Sampling Years	1988-1992, 1995, 1998-2001, 2007-2015
2015 Samplers	Ray Powers, Glenn Johnson and Julie Wicks
Main Contact	Ray Powers

Lake Map



Background

Lake Bonaparte is a 1,286 acre, class B lake found in the Town of Diana (and resides, in part, within the Fort Drum Military Reservation) in Lewis County, just outside the boundary of central western Adirondacks. It was first sampled as part of CSLAP in 1988.

It is one of four CSLAP lakes among the nearly 500 lakes and ponds found in Lewis County and one of 26 CSLAP lakes among the more than 1650 lakes and ponds in the St. Lawrence River drainage basin.

Lake Uses

Lake Bonaparte is a Class B lake; this means that the best intended use for the lake is for contact recreation—swimming and bathing, non-contact recreation—boating, aquatic life, and aesthetics. The lake is used by lake residents and visitors for swimming, power boating and other recreation via shoreline properties, state boat launch, two pubic marinas, and two restaurants.

Lake Bonaparte has been regularly stocked with trout and brown trout; about 1800 seven inch trout and 2800 eight to nine inch brown trout are stocked in the spring, with the assistance of the (Lewis) County Federated Sportsmen. Fish species identified at the lake include black bullhead, brown trout, lake trout, northern pike, smallmouth bass, walleye, and yellow perch.

General statewide fishing regulations are applicable in Lake Bonaparte. In addition, open season for walleye is the 1st Saturday in May through March 15th, with a minimum size of 18 inches and a daily limit of three fish. Ice fishing is allowed. There is a year-long open season for trout and lake trout, with daily size limits of 9 inches and 21 inches, and daily take limits of five and three fish, respectively.

There are no lake-specific fish consumption advisories on Lake Bonaparte.

Historical Water Quality Data

CSLAP sampling was conducted on Lake Bonaparte from 1988 to 1992, 1995, 1998 to 2001, and 2007 to 2015. The CSLAP reports for each of the past several years can be found on the NYSFOLA website at http://nysfola.mylaketown.com. The most recent CSLAP report and scorecard for Lake Bonaparte can also be found on the NYSDEC web page at http://www.dec.ny.gov/lands/77863.html.

Lake Bonaparte was sampled by the NYSDEC Division of Water as part of an ambient lake monitoring program in 1986 through the state Lake Classification and Inventory (LCI) survey. This monitoring program showed water quality conditions similar to those measured through CSLAP, at least for the water quality parameters measured in these programs. Lake Bonaparte was sampled as part of the pilot NYSDEC biomonitoring program conducted as part of the LCI in 2010. This data showed water quality conditions very similar to those measured through CSLAP, confirming the accuracy of the data collected by CSLAP sampling volunteers.

The lake was also sampled as part of the Conservation Department (predecessor to the NYSDEC) survey of the Oswegatchie-Black Rivers basin in 1931. This study, conducted in mid-July, did not report water transparency measurements, but it found moderately high dissolved oxygen reduction in deeper waters of the lake, although samples were not collected below a depth of 47 feet.

The field surveys conducted as part of the Biological Survey reported the following for Lake Bonaparte:

"Although Bonaparte Lake is large and deep enough to support a large number of lake trout and whitefish these two species seem to have become almost extinct. This has occurred in spite of the stocking of the former species which has taken place over the last ten years. An unfavorable factor is the almost entire absence of minnows from the lake. Apparently pike perch afford the only fishing which amounts to much, although a small number of bass and northern pike are taken. The introduction of a suitable food fish will be necessary before there can be any hope of a return of good fishing conditions. An experimental planting of the blunt-nose minnow is recommended.

A complication arises in the treatment of Lake Bonaparte through the fact that Mud Lake, which is continuous with it and which is in reality a wide-water in its outlet, is the natural spawning and nursery area for pike-perch, perch, northern pike and bullheads. It is closed to fishing by a group of people who own all of the surrounding land. Their right to close the lake was upheld in the circuit court, although a navigable channel from Bonaparte exists through which a freight and passenger boat was operated on a regular schedule some years ago."

Plant survey information from this study is provided later in this report.

Neither the inlets (Clark Creek, Dobson Creek) nor the outlet (Bonaparte Creek) has been monitored through the NYSDEC Rotating Intensive Basins (RIBS) program or the state stream macroinvertebrate monitoring program. The lake was sampled by DEC fisheries staff in support of fish stocking activities. These data show lower water clarity readings than reported through CSLAP, and dissolved oxygen deficits near the extreme lake bottom.

Lake Association and Management History

Lake Bonaparte is served by the Lake Bonaparte Conservation Club. The Club is involved in a variety of lake management activities, including:

- milfoil control projects, using biocontrol measures (weevils)
- sponsoring boater safety classes
- maintaining an historic gazebo, walkway and welcome to Lake Bonaparte signs
- active support of the Town of Diana Historical Museum
- lake community picnics, auction, tee shirt night, and a welcome back to the lake party
- a regularly published newsletter

The Lake Bonaparte Conservation Club maintains a website at http://lakebonaparte.mylaketown.com/.

Summary of 2015 CSLAP Sampling Results

Evaluation of 2015 Annual Results Relative to 1988-2014

The summer (mid-June through mid-September) average readings are compared to historical averages for all CSLAP sampling seasons in the "Lake Condition Summary" table, and are compared to individual historical CSLAP sampling seasons in the "Long Term Data Plots –Lake Bonaparte" section in Appendix C.

Evaluation of Eutrophication Indicators

Water clarity readings were lower than normal in 2015, part of a long-term decrease in clarity and a long-term increase in phosphorus readings over the last fifteen years. However, algae levels were also lower than normal in 2015, and these readings have varied slightly from year to year. This suggests that any apparent changes in the trophic indicators may have been part of normal variability for the lake.

No clear seasonal changes have been apparent in any of these trophic indicators in the typical CSLAP sampling season, although water clarity may decrease slightly in early summer in some years. In 2015, water clarity increased in late summer, coincident with decreasing nutrient levels, but algae readings did not exhibit any clear changes.

The lake can be characterized as *mesoligotrophic*, or moderately unproductive, based on water clarity, chlorophyll *a* (both typical of *mesotrophic* lakes), and total phosphorus readings (typical of *oligotrophic* lakes). The trophic state indices (TSI) evaluation suggests that phosphorus readings are slightly lower than expected given the algae levels and water clarity, suggesting that small increases in phosphorus loading to the lake may trigger larger increases in the other trophic indicators. Overall trophic conditions are summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Potable Water Indicators

Algae levels are not high enough to render the lake susceptible to taste and odor compounds or elevated DBP (disinfection by product) compounds that could affect the potability of the water, but the lake is not used for drinking water. Hypolimnetic phosphorus and ammonia readings are similar to those measured at the lake surface (although deepwater ammonia levels were slightly higher than usual in 2015). This suggests that deepwater intakes may be supported for any "unofficial" potable water use. Potable water conditions, at least as measurable through CSLAP, are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Limnological Indicators

Conductivity readings were slightly lower than usual in 2015, but these readings have not changed much in the last two decades. Calcium levels were also slightly lower than usual in the last two years. pH readings have decreased over the last 10-15 years, but these readings were close to normal in 2015. None of the other indicators has exhibited any clear long-term trends, and it is likely that the small changes in each of these limnological indicators have been within the normal range of variability in the lake.

Chloride levels in the 2015 samples, conducted for the first time through CSLAP and cited in Appendix A, were about 11 mg/l. These values are within the lower end of the range of "low" road salt runoff levels cited by the New Hampshire DES, although they are well below the state potable water quality standard of 250 mg/l and below range of values found in a number of NYS lakes.

Overall limnological conditions are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Biological Condition

The fluoroprobe screening samples analyzed by SUNY ESF in recent years indicated very low overall algae levels and low blue green algae levels. The algal community appears to be comprised of a mix of algae species. No shoreline blooms have been reported or sampled in 2015 or other recent years.

Extensive macrophyte surveys have been conducted through CSLAP in Lake Bonaparte, although at least three protected plant species (*Megalodonta beckii*, water marigold; *Potamogeton filiformis*, thread-leaf pondweed; and *Utricularia radiata*, little floating bladderwort) and at least two exotic plant species (*Myriophyllum spicatum*, Eurasian watermilfoil, and *Myriophyllum heterophyllum*, variable watermilfoil) have been found in the lake. The 2010 biomonitoring survey found at least 24 plant species, including *Nitellopsis obtusa* (starry stonewort), an invasive macroalga. This survey did not find thread-leaf pondweed, little floating bladderwort, or variable watermilfoil. The modified floristic quality index (FQI) for the lake indicates that the quality of the aquatic plant community is "excellent."

The composition of the fish community includes a mix of coldwater (at least one species), coolwater (at least two species) and warmwater (at least two species) fish species—it is assumed that this represents an incomplete inventory. It is likely that the lake supports a two story fishery.

Zooplankton surveys have not been conducted through CSLAP at Lake Bonaparte, and the macroinvertebrate analyses from the biomonitoring study have not yet been completed.

Biological conditions in the lake are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Lake Perception

Recreational and water quality assessments were close to normal in 2015, and neither of these indicators of lake perception has exhibited any clear long-term changes. This is consistent with an apparent long-term stability (or small but unpredictable changes) in aquatic plant coverage. Recreational and water quality assessments degrade slightly during the typical summer, consistent with seasonal increases in aquatic plant coverage (and despite the lack of seasonal change in measured water quality conditions). There were no clear seasonal changes in lake perception in 2014 or 2015. Overall lake perception is summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Local Climate Change

Water temperature readings in the summer index period have varied slightly over the last few years—increasing from 2008 to 2012, decreasing from 2012 to 2014, and higher in 2015. It is not known if local climate change can be well evaluated through CSLAP.

Evaluation of Algal Toxins

Algal toxin levels can vary significantly within blooms and from shoreline to lake, and the absence of toxins in a sample does not indicate safe swimming conditions. Fluoroprobe readings were below the thresholds for harmful algal blooms (HABs) in the open water. Algal toxin levels in the open water were well below the criteria indicating susceptibility for either drinking water or swimming (occasionally elevated readings do not appear to be an accurate representation of

local conditions, since blue green algae levels are very low in these samples). No shoreline algae blooms have been reported or sampled in the lake, at least in recent years.

Lake Condition Summary

Category	Indicator	Min	Overall Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	3.11	4.73	9.04	4.74	Mesotrophic	Within Normal Range	No Change
	Chlorophyll *a*	0.10	2.25	5.20	2.09	Mesotrophic	Within Normal Range	No Change
	Total Phosphorus	0.000	0.008	0.022	0.010	Oligotrophic	Higher than Normal	No Change
Potable Water Indicators	Hypolimnetic Ammonia	0.02	0.06	0.24	0.05	Close to Surface NH4 Readings	Lower Than Normal	Not known
	Hypolimnetic Arsenic							Not known
	Hypolimnetic Iron							Not known
	Hypolimnetic Manganese							Not known
Limnological Indicators	Hypolimnetic Phosphorus	0.000	0.020	0.090	0.014	Close to Surface TP Readings	Lower Than Normal	Not known
	Nitrate + Nitrite	0.00	0.01	0.15	0.01	Low NOx	Lower Than Normal	No Change
	Ammonia	0.00	0.03	0.23	0.02	Low Ammonia	Within Normal Range	Not yet known
	Total Nitrogen	0.13	0.36	3.18	0.65	Low Total Nitrogen	Higher than Normal	Not yet known
	pH	6.68	7.96	8.60	7.26	Alkaline	Lower Than Normal	Decreasing Significantly
	Specific Conductance	104	173	213	168	Intermediate Hardness	Within Normal Range	No Change
	True Color	1	11	62	8	Intermediate Color	Within Normal Range	Increasing Slightly
	Calcium	15.8	24.7	29.4	19.0	Highly Susceptible to Zebra Mussels	Lower Than Normal	Not yet known
Lake Perception	WQ Assessment	1	1.8	2	1.9	Not Quite Crystal Clear	Within Normal Range	No Change
	Aquatic Plant Coverage	1	2.8	4	3.0	Surface Plant Growth	Within Normal Range	No Change
	Recreational Assessment	1	2.0	3	1.4	Excellent	More Favorable Than Normal	No Change
Biological Condition	Phytoplankton					Open water-low blue green algae biomass	Not known	Not known
	Macrophytes					Excellent quality of the aquatic plant community	Not known	Not known
	Zooplankton					Not measured through CSLAP	Not known	Not known
	Macroinvertebrates					2010 data not yet available	Not known	Not known
	Fish					Two story fishery?	Not known	Not known
	Invasive Species					Eurasian watermilfoil, variable watermilfoil, starry stonewort	Not known	Not known
Local Climate Change	Air Temperature	7	20.9	32	23.3		Higher Than Normal	No Change
	Water Temperature	11	21.1	26	22.0		Higher Than Normal	No Change

Category	Indicator	Min	Overall Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Harmful Algal Blooms	Open Water Phycocyanin	3	10	40	8	No readings indicate high risk of BGA	Not known	Not known
	Open Water FP Chl.a	0	2	6	1	No readings indicate high algae levels	Not known	Not known
	Open Water FP BG Chl.a	0	1	4	0	No readings indicate high BGA levels	Not known	Not known
	Open Water Microcystis	<DL	<DL	4.3	<DL	Low to undetectable open water microcystins	Not known	Not known
	Open Water Anatoxin a	<DL	<DL	<DL	<DL	Open water Anatoxin-a consistently not detectable	Not known	Not known
	Shoreline Phycocyanin					No shoreline blooms sampled for PC	Not known	Not known
	Shoreline FP Chl.a					No shoreline blooms sampled for FP	Not known	Not known
	Shoreline FP BG Chl.a					No shoreline blooms sampled for FP	Not known	Not known
	Shoreline Microcystis					No shoreline bloom MC-LR data	Not known	Not known
	Shoreline Anatoxin a					No shoreline bloom anatoxin data	Not known	Not known

Evaluation of Lake Condition Impacts to Lake Uses

Lake Bonaparte is presently among the lakes cited on the 2009 St. Lawrence River Basin Priority Waterbody List (PWL), with public bathing, recreation and habitat/hydrology listed as *stressed* due to excessive weed growth. The PWL listing for Lake Bonaparte is listed in Appendix B.

Potable Water (Drinking Water)

The CSLAP dataset at Lake Bonaparte, including water chemistry data, physical measurements, and volunteer samplers' perception data, is inadequate to evaluate the use of the lake for potable water, and the lake is not used for this purpose. The limited CSLAP data do not show any impacts for "unofficial" use of the lake for potable water.

Public Bathing

The CSLAP dataset at Lake Bonaparte, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that public bathing, if conducted at a public swimming beach, should be supported, although additional information about bacterial levels is needed to evaluate the safety of the water for swimming.

Recreation (Swimming and Non-Contact Uses)

The CSLAP dataset on Lake Bonaparte, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that recreation is supported, although this use may be *threatened* by the presence of Eurasian watermilfoil and variable watermilfoil.

Aquatic Life

The CSLAP dataset on Lake Bonaparte, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aquatic life should be supported, although this use may be *threatened* by occasionally elevated pH and the presence of exotic plants. Additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

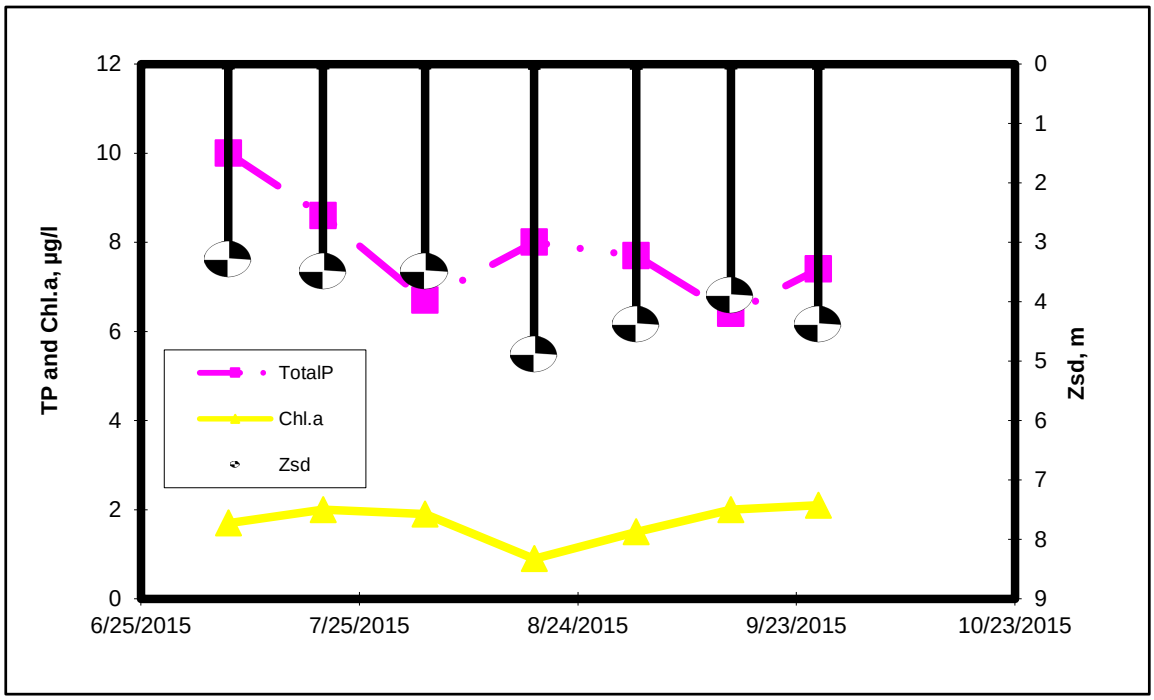
Aesthetics and Habitat
The CSLAP dataset on Lake Bonaparte, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics should be *good*, although this condition may be impacted by excessive plant growth. Habitat should also be *good*, but invasive plants may affect this condition.

Fish Consumption
There are no fish consumption advisories posted for Lake Bonaparte.

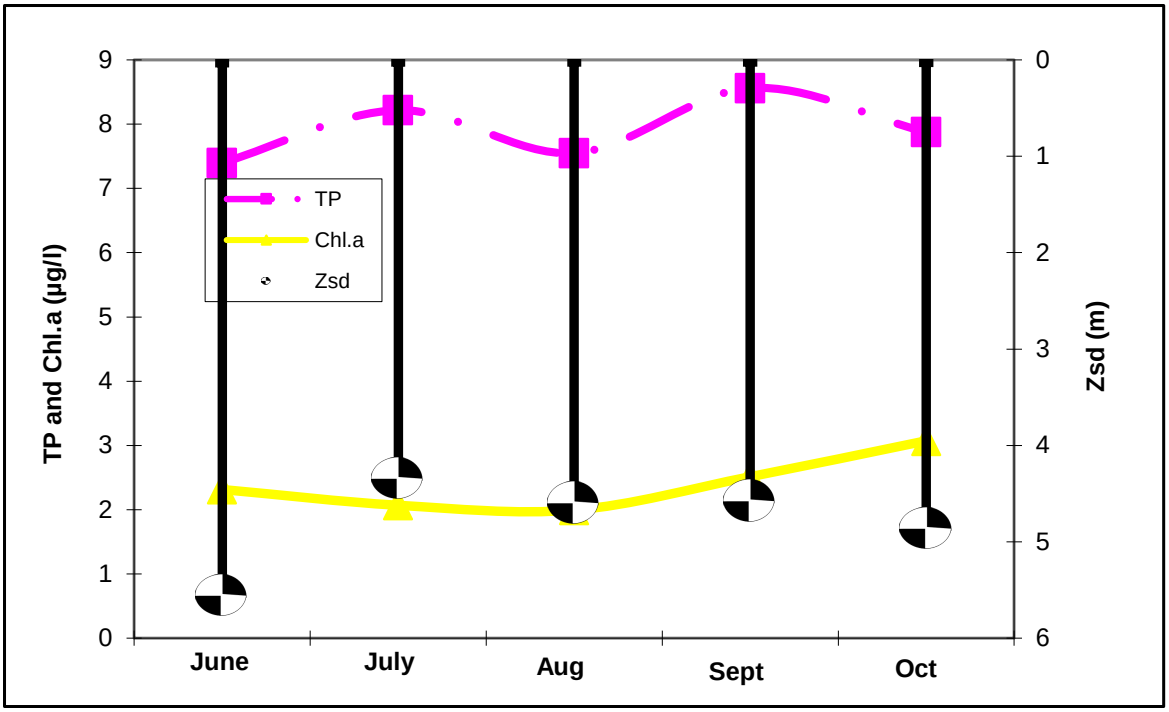
Additional Comments and Recommendations
Lake Bonaparte may be a good candidate for detailed aquatic plant monitoring to evaluate the effectiveness of the herbivorous insect stocking. Lake residents are advised to report and avoid exposure to any shoreline blue green algae blooms, although the lake does not appear to be very susceptible to these blooms. Any sources of nutrients leading to the recent increase in phosphorus should be evaluated.

Aquatic Plant IDs-2015
None submitted for identification in 2015.

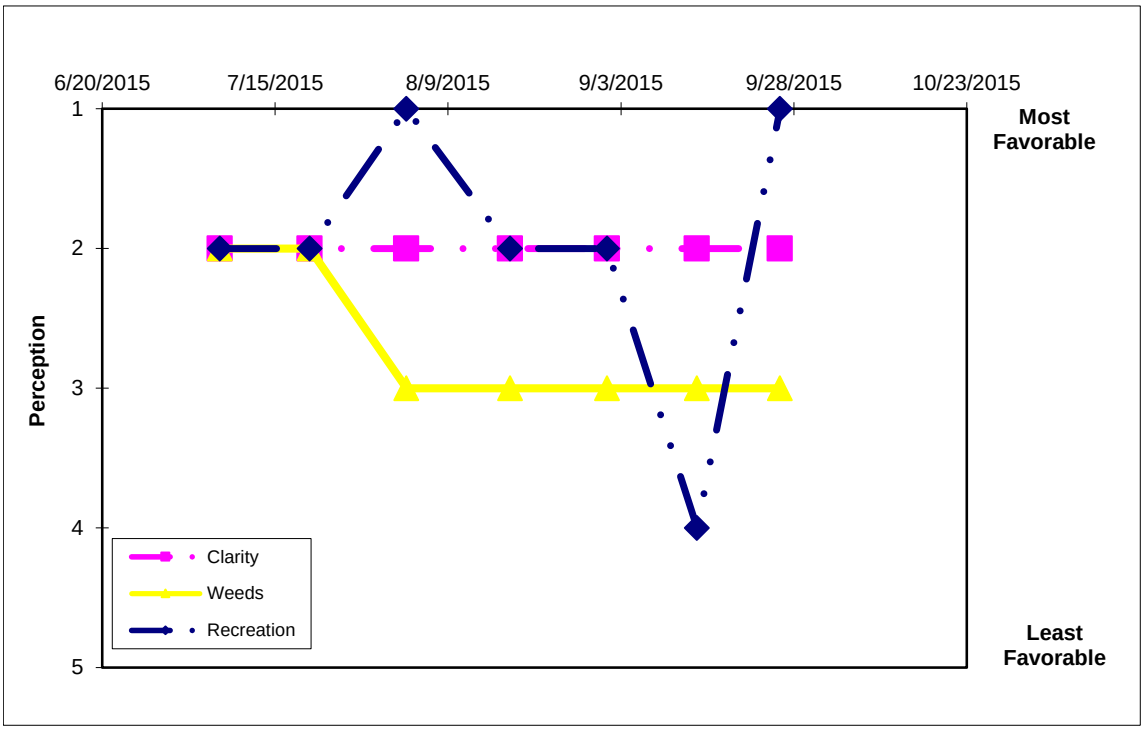
Time Series: Trophic Indicators, 2015



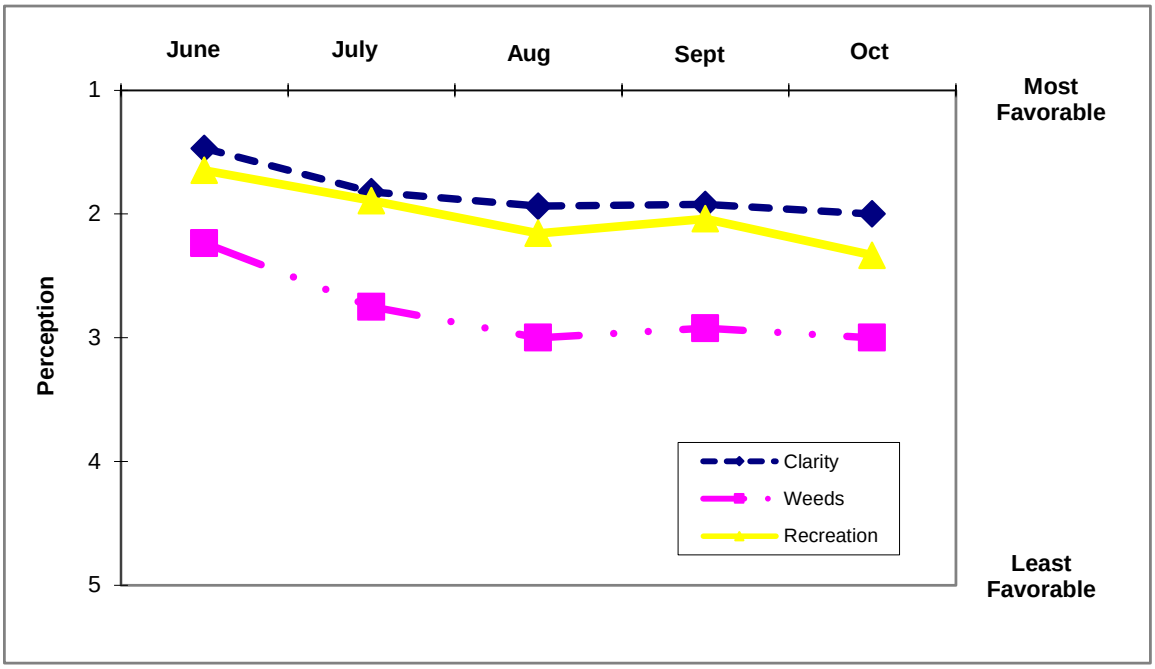
Time Series: Trophic Indicators, Typical Year (1988-2015)



Time Series: Lake Perception Indicators, 2015



Time Series: Lake Perception Indicators, Typical Year (1988-2015)



Appendix A- CSLAP Water Quality Sampling Results for Lake Bonaparte

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH3	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
50	L Bonaparte	6/21/1988	21.3	5.13	1.5	0.008	0.01				12	8.36	173		3.40	
50	L Bonaparte	6/29/1988	21.3	4.30	1.5	0.013	0.01				10	8.20	180		5.18	
50	L Bonaparte	7/5/1988	21.3	3.11	1.5	0.009	0.01				10	8.40	176		2.30	
50	L Bonaparte	7/12/1988	21.3	3.26	1.5	0.008	0.01				10	8.36	176		2.29	
50	L Bonaparte	7/19/1988	21.3	3.43	1.5	0.006	0.01				9				2.37	
50	L Bonaparte	7/26/1988	21.3	3.95	1.5	0.009	0.01				9	8.35	174		2.15	
50	L Bonaparte	8/2/1988	21.3	3.32	1.5	0.006	0.01				6	8.50	168		1.92	
50	L Bonaparte	8/8/1988	21.3	4.38	1.5	0.011	0.01				5	8.34	170		1.65	
50	L Bonaparte	8/16/1988	21.3	3.84	1.5	0.011	0.01				8	8.38	178		2.15	
50	L Bonaparte	8/23/1988	21.3	3.55	1.5	0.006	0.01				8	8.33	175		2.07	
50	L Bonaparte	8/30/1988	21.3	4.41	1.5	0.007	0.02				6	8.36	180		3.63	
50	L Bonaparte	9/6/1988	21.3	3.84	1.5	0.015	0.01				7	8.36	172		3.70	
50	L Bonaparte	9/12/1988	21.3	4.04	1.5	0.009	0.01				11	8.34	168		2.96	
50	L Bonaparte	9/23/1988	21.3	3.58	1.5	0.009	0.01				6	8.29	185		4.00	
50	L Bonaparte	9/28/1988	21.3	3.84	1.5	0.007	0.01				6	8.28	176		2.74	
50	L Bonaparte	6/23/1989	21.3	9.04	1.5	0.006	0.06				10	7.99	172		1.23	
50	L Bonaparte	7/5/1989	21.3	5.34	1.5	0.007					12	8.11	174		1.76	
50	L Bonaparte	7/19/1989	21.3	3.64	1.5	0.007	0.01				12	8.13	177		3.05	
50	L Bonaparte	8/2/1989	21.3	3.86	1.5	0.006					8	8.17	178		1.85	
50	L Bonaparte	8/16/1989	21.3	4.28	1.5	0.005	0.01				8	8.32	175		1.75	
50	L Bonaparte	8/30/1989	21.3	5.11	1.5	0.010					7	8.33	177		2.22	
50	L Bonaparte	9/13/1989	21.3	4.65	1.5	0.008	0.01				9	8.33	180		1.81	
50	L Bonaparte	9/27/1989	21.3	3.51	1.5	0.006					4	7.02	187		2.22	
50	L Bonaparte	7/5/1990	21.3	4.04	1.5	0.010	0.01				13	8.18	175		2.38	
50	L Bonaparte	7/18/1990	21.3	3.80	1.5	0.009					8	7.49	182		0.65	
50	L Bonaparte	8/1/1990	21.3	5.34	1.5	0.007	0.01				8	8.26	166		1.67	
50	L Bonaparte	8/15/1990	21.3	4.51	1.5	0.006					8	8.21	165		2.00	
50	L Bonaparte	8/29/1990	21.3	4.85	1.5	0.013	0.01				8	8.34	160		1.14	
50	L Bonaparte	9/12/1990	21.3	4.85	1.5	0.008					7	8.33	170		0.83	
50	L Bonaparte	9/26/1990	21.3	4.80	1.5	0.010	0.01				13	8.41	119		2.22	
50	L Bonaparte	10/10/1990	21.3	5.29	1.5	0.011					9	8.29	169		3.16	
50	L Bonaparte	6/14/1991	21.3	6.37	1.5	0.008	0.01				6	8.07	153		2.96	
50	L Bonaparte	6/26/1991	21.3	5.32	1.5	0.005					10	8.24	162		1.46	
50	L Bonaparte	7/14/1991	21.3	5.26	1.5	0.007	0.01				6	8.29	169		2.53	
50	L Bonaparte	7/24/1991	21.3	5.20	1.5	0.008					7	8.33	164		1.80	
50	L Bonaparte	8/6/1991	21.3	5.72	1.5	0.008	0.01				4	8.20	178		1.63	
50	L Bonaparte	8/20/1991	21.3	4.70	1.5	0.009					9	8.35	179		1.52	
50	L Bonaparte	9/3/1991	21.3	4.50	1.5	0.006	0.01				9	8.37	180		2.21	
50	L Bonaparte	9/17/1991	21.3	4.27	1.5	0.007					4	8.26	177		2.90	
50	L Bonaparte	6/3/1992	21.3	7.42	1.5	0.009	0.05				12	8.26	173		1.29	
50	L Bonaparte	6/17/1992	21.3	6.04	1.5	0.006	0.01				8	8.18	175		1.40	
50	L Bonaparte	7/1/1992	21.3	5.85	1.5	0.007	0.01				10	8.23	176		1.70	
50	L Bonaparte	7/15/1992	21.3	5.00	1.5	0.009					13	8.35	178		1.84	
50	L Bonaparte	7/28/1992	29.2	4.70	1.5	0.007	0.01				7	8.02	156		1.45	
50	L Bonaparte	8/11/1992	21.3	5.37	1.5	0.006					10	8.23	168		1.68	
50	L Bonaparte	8/25/1992	21.3	6.18	1.5	0.007	0.01				9	8.31	176		1.33	
50	L Bonaparte	9/9/1992	21.3	5.66	1.5	0.007					8	8.30	153		2.01	
50	L Bonaparte	7/13/1998	21.6	4.50	1.5		0.01				5	8.22	173			
50	L Bonaparte	7/27/1998	21.3	4.58	1.5		0.01				7	8.31	180		1.82	
50	L Bonaparte	8/11/1998	21.6	6.13	0.4		0.01				6	8.35	177		3.29	
50	L Bonaparte	8/25/1998	21.6	4.40	1.5		0.01				7	8.23	176		2.83	
50	L Bonaparte	9/8/1998	21.7	4.55	1.5	0.008					12	8.31	180		2.76	
50	L Bonaparte	9/22/1998	21.6	4.80	1.5	0.006					6	8.23	181		2.80	
50	L Bonaparte	6/7/1999	21.6	6.40	1.5	0.006	0.01				10	7.87	185		1.78	
50	L Bonaparte	6/28/1999	21.6	5.20	1.5	0.007	0.01				4	8.49	186		2.04	
50	L Bonaparte	7/12/1999	21.6	4.00	1.5	0.007	0.04				7	8.37	179		2.15	
50	L Bonaparte	7/26/1999	21.7	5.00	1.5	0.005	0.01				7	8.57	177		1.94	
50	L Bonaparte	8/9/1999	21.6	5.00	1.5	0.007	0.01				5	8.45	183		2.81	
50	L Bonaparte	8/23/1999	22.0	4.00	1.5	0.007	0.01				5	8.60	175		1.94	
50	L Bonaparte	9/13/1999	21.6	4.80	1.5	0.007	0.01				7	8.14	185		2.02	
50	L Bonaparte	9/20/1999	21.6	4.10	1.5	0.007	0.01				6	8.40	184		2.44	
50	L Bonaparte	5/30/2000	21.6	6.98	1.5	0.011	0.02				10	7.80	182		2.38	
50	L Bonaparte	6/26/2000		5.50	1.5	0.005	0.01				8	8.28	181		2.09	
50	L Bonaparte	7/11/2000	22.0	4.20	1.5	0.005	0.01				7	8.04	185		2.35	
50	L Bonaparte	7/24/2000	22.0	5.45	1.5	0.005	0.01				8	7.82	186		2.54	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH3	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
50	L Bonaparte	8/7/2000	22.0	4.93	1.5	0.006	0.01				8	7.52	185		2.06	
50	L Bonaparte	8/21/2000	22.0	7.13	1.5	0.007	0.01				8	7.99	183		1.52	
50	L Bonaparte	9/5/2000	22.0	6.95	1.5	0.006	0.01				12	8.06	185		2.26	
50	L Bonaparte	9/18/2000	21.6	5.68	1.5	0.009	0.01				11	8.13	187		1.82	
50	L Bonaparte	6/5/2001	21.6	5.13	1.5	0.006	0.01				10	8.08	188		1.30	
50	L Bonaparte	6/19/2001	21.6	7.05	1.5	0.007	0.01				6	8.30	189		1.60	
50	L Bonaparte	7/3/2001	21.6	5.08	1.5	0.007	0.01				6	8.30	190		2.06	
50	L Bonaparte	7/16/2001	21.6	5.58	1.5	0.005	0.01				6	8.17	188		2.06	
50	L Bonaparte	7/31/2001	21.6	5.35	1.5	0.007	0.01				4	8.26	191		0.59	
50	L Bonaparte	8/14/2001	21.6	5.40	1.5	0.006					7	8.55	193			
50	L Bonaparte	8/28/2001	21.6	5.10	1.5	0.006					6	8.22	187		1.37	
50	L Bonaparte	9/12/2001	21.6	4.00	1.5	0.005					8	8.42	189		1.63	
50	L Bonaparte	7/30/2007	21.5	4.90		0.015	0.15	0.01	0.52	74.1	21			25.9	1.07	
50	L Bonaparte	8/6/2007	22.0	4.35	1.5	0.012	0.01	0.02	0.62	117.2	16	8.38	142	26.8	1.48	
50	L Bonaparte	8/13/2007	21.5	4.40	1.5	0.009	0.00	0.03	0.63	150.3	16	8.01	165		1.56	
50	L Bonaparte	8/22/2007	21.5	4.40	1.5	0.007	0.01	0.02	0.63	190.8	1	7.52	175		1.76	
50	L Bonaparte	8/27/2007	21.0	5.05	1.5	0.006	0.00	0.01	0.46	169.8	6	8.05	165		1.92	
50	L Bonaparte	9/3/2007	21.0	4.65	1.5	0.009	0.01	0.02	0.55	143.5	16	8.06	104		1.71	
50	L Bonaparte	9/11/2007	21.0	5.00	1.5	0.009	0.01	0.01	0.63	150.8	22	8.18	170		2.01	
50	L Bonaparte	9/17/2007	21.0	5.10	1.5	0.007	0.01	0.01	0.61	208.0	14	8.13	187		2.51	
50	L Bonaparte	6/30/2008	22.0	4.80	1.5	0.007	0.01	0.05	0.21	66.58	16	7.14	129	25.2	2.53	
50	L Bonaparte	7/15/2008	20.5	5.20		0.007	0.02	0.02	0.19	58.06	10	7.51	147		2.37	
50	L Bonaparte	7/29/2008	21.2	5.10	1.5	0.000	0.01	0.03	0.22	1367.54	9	7.00	158		2.12	
50	L Bonaparte	8/11/2008	21.3	4.10	1.5	0.007	0.01	0.03	0.22	66.11	25	7.88	159		1.09	
50	L Bonaparte	8/25/2008	21.0	4.35	1.5	0.006	0.01	0.01	0.31	111.84	16	8.10	174	23.6	2.25	
50	L Bonaparte	9/11/2008	20.5	4.80	1.5	0.009	0.02	0.01	0.34	82.63	18	7.87	203		2.25	
50	L Bonaparte	9/23/2008	20.5	5.00	1.5	0.004	0.01	0.01	0.23	128.09	22	7.49	172		2.37	
50	L Bonaparte	10/7/2008	21.0	5.50	1.5	0.009	0.01	0.02	0.20	50.10	7	7.23	172		1.33	
50	L Bonaparte	06/08/2009	20.0	5.25		0.008	0.02	0.01	0.27	72.85	17	7.23	172	24.7	2.57	
50	L Bonaparte	06/23/2009	21.0	4.95	1.5	0.010	0.04	0.02	0.24	50.35	26	7.35	166		4.89	
50	L Bonaparte	07/06/2009	21.0	3.80	1.5	0.016	0.00	0.00	0.32	44.00	11	7.93	164		3.16	
50	L Bonaparte	07/20/2009	21.0	3.65		0.009	0.02	0.01	0.24	60.31	18	7.32	135		0.93	
50	L Bonaparte	08/03/2009	21.0	3.90	1.5	0.008	0.02	0.02	0.23	61.23	26	7.46	150	27.4	2.71	
50	L Bonaparte	08/18/2009	21.5	3.85		0.008	0.01	0.02	0.21	60.57	15	8.14	153		1.80	
50	L Bonaparte	08/31/2009	21.0	3.90	1.5	0.008	0.04	0.02	0.24	62.55	27	7.53	142		3.20	
50	L Bonaparte	09/14/2009	21.5	4.00		0.007	0.01	0.01	0.19	61.07	22	7.59	130		3.00	
50	L Bonaparte	6/15/2010	20.5	6.15		0.009	0.01	0.23	0.19	45.17	8	8.20	207	29.4	1.30	
50	L Bonaparte	6/29/2010	20.0	4.25	1.5	0.010	0.01	0.01	0.34	75.68	13	7.98	183		3.50	
50	L Bonaparte	7/12/2010	21.0	4.60	1.5	0.008	0.04	0.04	0.28	76.86	6	8.24	205		1.90	
50	L Bonaparte	7/28/2010	20.0	4.15	1.5	0.008	0.01	0.02	0.38	106.38	35	8.42	205		2.30	
50	L Bonaparte	8/12/2010	21.0	4.20	1.5	0.005	0.02	0.03	0.34	157.28	62	8.48	209	27.0	2.10	
50	L Bonaparte	8/31/2010	21.0	4.50	1.5	0.009	0.02	0.07	0.26	61.89	13	7.87	203		2.60	
50	L Bonaparte	9/18/2010	21.0	4.60	1.5	0.011	0.14	0.01	0.33	67.85	16	7.40	193		4.90	
50	L Bonaparte	10/3/2010	21.0	4.30	1.5	0.002	0.02	0.02	0.41	445.50	14	7.98	213		4.10	
50	L Bonaparte	6/6/2011	21.0	5.20	1.5	0.007	0.03	0.03	0.44	148.00	13	7.79	187	21.0		
50	L Bonaparte	6/20/2011	21.0	5.45	1.5	0.007	0.01	0.03	0.17	51.43	17	6.68	148		1.80	
50	L Bonaparte	7/5/2011	21.0	4.55	1.5	0.011	0.01	0.01	0.29	59.42	15	7.55	195		1.10	
50	L Bonaparte	7/19/2011	21.0	3.75	1.5	0.008	0.01	0.01	0.31	87.72	16	7.55	192		2.30	
50	L Bonaparte	8/2/2011	21.0	3.80	1.5	0.007	0.01	0.03	0.31	90.97	23	8.14	176	26.6	2.70	
50	L Bonaparte	8/16/2011	22.0	4.55	1.5	0.007	0.01	0.01	0.13	42.98	12	8.05	153		2.70	
50	L Bonaparte	8/29/2011	22.0	5.75	1.5	0.007	0.01	0.05	0.24	80.00	12	7.35	181		3.10	
50	L Bonaparte	9/12/2011	21.0	4.55	1.5	0.006	0.01	0.03	0.33	114.19	22	7.33	181		2.70	
50	L Bonaparte	6/25/2012	21.5	4.25	1.5	0.011	0.01	0.04	0.31	62.71	10	8.00	194	23.0	2.70	
50	L Bonaparte	7/16/2012	21.5	3.90	1.5	0.011	0.01	0.02	0.27	56.87	10	8.22	172		2.90	
50	L Bonaparte	7/30/2012	21.1	4.20	1.5	0.008	0.01	0.01	0.25	64.95	14	7.88	179		1.80	
50	L Bonaparte	8/13/2012	21.0	4.05	1.5	0.008	0.01	0.02	0.35	92.95	15	7.21	159		2.70	
50	L Bonaparte	8/28/2012	21.0	4.10	1.5	0.007	0.01	0.02	0.29	93.91	7	7.49	180	27.7	1.20	
50	L Bonaparte	9/10/2012	22.0	4.55	1.5	0.007	0.01	0.03	0.27	81.07	7	7.03	119		1.40	
50	L Bonaparte	9/24/2012	21.5	4.55	1.5	0.012	0.01	0.02	0.29	52.59	10	7.33	170		4.40	
50	L Bonaparte	10/11/2012	21.5	4.35	1.5	0.010	0.01	0.01	0.24	54.08	7	6.93	173		3.70	
50	L Bonaparte	6/10/2013	21.6	4.65	1.5		0.01	0.01	0.28	11.56	11	7.61	176		2.60	
50	L Bonaparte	6/24/2013	21.0	4.05	1.5	0.008			0.27	78.29	16	7.59	156		2.00	
50	L Bonaparte	7/8/2013	22.0	3.45	1.5	0.013	0.01	0.02	0.16	26.00	19	8.07	170		3.70	
50	L Bonaparte	7/23/2013	21.0	3.55	1.5	0.010			0.36	83.31	15	7.38	159		1.60	
50	L Bonaparte	8/6/2013	22.2	3.85	1.5	0.009	0.01	0.02	0.26	67.28	23	7.70	182			
50	L Bonaparte	8/19/2013	22.0	3.90	1.5	0.008			0.37	99.89	19	7.68	183		1.80	
50	L Bonaparte	9/2/2013	22.0	4.25	1.5	0.008	0.01	0.22	0.33	94.08	28	7.92	155		1.90	
50	L Bonaparte	9/17/2013	22.0	3.85	1.5	0.016			0.42	58.64	21	7.13	174		5.20	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH3	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
50	L Bonaparte	6/23/2014	22.0	5.80	1.5	0.007	0.00	0.01			8	7.04	176	15.8	1.30	
50	L Bonaparte	7/8/2014	22.0	3.60	1.5	0.009			0.27	69.03	11	7.50	172		3.60	
50	L Bonaparte	7/22/2014	22.0	3.80	1.5	0.008	0.01	0.03	0.23	65.72	9	7.10	174		2.30	
50	L Bonaparte	8/5/2014	22.0	4.50	1.5	0.007			0.24	77.80	4	7.24	165		2.20	
50	L Bonaparte	8/19/2014	22.0	5.40	1.5	0.008	0.01	0.01	3.18	920.24	8	7.09	156	22.2	0.10	
50	L Bonaparte	9/1/2014	22.0	5.50	1.5	0.022			0.21	21.40	10	7.54	170		2.40	
50	L Bonaparte	9/15/2014	22.0	4.90	1.5	0.009	0.01	0.02	0.19	50.21	8	7.33	169		2.80	
50	L Bonaparte	9/30/2014	22.0	4.40	1.5	0.013			0.23	39.84	8	7.20	163		2.00	
50	L Bonaparte	7/7/2015	21.5	3.30	1.5	0.010	0.02	0.04	0.28	27.50	16	7.24	154	20.6	1.70	
50	L Bonaparte	7/20/2015	22.0	3.50	1.5	0.009			0.26	30.00	13	7.70	172		2.00	
50	L Bonaparte	8/3/2015	22.0	3.50	1.5	0.007	0.01	0.03	0.32	47.01	14	7.33	139		1.90	10.8
50	L Bonaparte	8/18/2015	22.0	4.90	1.5	0.008			0.35	44.13	13	7.66	179		0.90	
50	L Bonaparte	9/1/2015	21.0	4.40	1.5	0.008	0.01	0.05	0.46	59.87	12	7.46	100	19.2	1.50	
50	L Bonaparte	9/14/2015	22.5	3.90	1.5	0.006			0.16	25.47	2	8.14	88		2.00	
50	L Bonaparte	9/26/2015	20.3	4.40	1.5	0.007	0.01	0.04	0.30	40.14	4	8.54	95		2.10	
50	L Bonaparte	9/22/1998			20.4	0.090										
50	L Bonaparte	7/27/1998			20.4	0.065										
50	L Bonaparte	8/25/1998			20.4	0.041										
50	L Bonaparte	7/30/2007	21.5		20.0	0.018										
50	L Bonaparte	8/13/2007	21.5		20.0	0.017										
50	L Bonaparte	8/22/2007	21.5		20.0	0.044										
50	L Bonaparte	8/27/2007	21.0		20.0	0.026										
50	L Bonaparte	9/3/2007	21.0		20.0	0.025										
50	L Bonaparte	9/11/2007	21.0	4.85	13.2	0.018										
50	L Bonaparte	9/17/2007				0.022										
50	L Bonaparte	6/30/2008			20.0	0.018										
50	L Bonaparte	7/15/2008			19.0	0.013										
50	L Bonaparte	7/29/2008			20.0	0.009										
50	L Bonaparte	8/25/2008			19.5	0.015										
50	L Bonaparte	9/11/2008			19.0	0.010										
50	L Bonaparte	9/23/2008			19.0	0.013										
50	L Bonaparte	10/7/2008			19.5	0.017										
50	L Bonaparte	06/08/2009	20.0		18.5	0.007		0.02								
50	L Bonaparte	06/23/2009	21.0		19.5	0.010										
50	L Bonaparte	07/06/2009	21.0		19.5	0.013		0.02								
50	L Bonaparte	07/20/2009	21.0		19.5	0.009										
50	L Bonaparte	08/03/2009	21.0		19.5	0.018		0.06								
50	L Bonaparte	08/18/2009	21.5		20.0	0.012										
50	L Bonaparte	08/31/2009	21.0		19.5	0.000		0.04								
50	L Bonaparte	09/14/2009	21.5		20.0	0.017										
50	L Bonaparte	6/15/2010	20.5			0.019		0.09								
50	L Bonaparte	7/12/2010	21.0			0.017		0.02								
50	L Bonaparte	8/12/2010	21.0			0.016		0.02								
50	L Bonaparte	9/18/2010	21.0			0.056		0.18								
50	L Bonaparte	6/6/2011	21.0		19.5	0.018		0.03								
50	L Bonaparte	7/5/2011	21.0		19.5	0.016		0.02								
50	L Bonaparte	8/2/2011	21.0		19.5	0.015		0.02								
50	L Bonaparte	8/29/2011	22.0		20.5			0.09								
50	L Bonaparte	6/25/2012			20.0	0.009		0.04								
50	L Bonaparte	7/30/2012			19.6	0.002		0.02								
50	L Bonaparte	8/28/2012			19.5	0.004		0.08								
50	L Bonaparte	9/24/2012			20.0	0.032		0.24								
50	L Bonaparte	6/10/2013			21.2	0.060		0.02								
50	L Bonaparte	7/8/2013			20.5	0.003		0.03								
50	L Bonaparte	8/6/2013			20.7	0.011		0.22								
50	L Bonaparte	9/2/2013			20.5	0.010		0.12								
50	L Bonaparte	6/23/2014			20.5	0.022		0.04								
50	L Bonaparte	7/8/2014			20.5	0.015										
50	L Bonaparte	7/22/2014			20.5	0.007		0.04								
50	L Bonaparte	8/5/2014			20.5	0.023										
50	L Bonaparte	8/19/2014			20.5	0.024		0.08								
50	L Bonaparte	9/1/2014			20.5	0.001										
50	L Bonaparte	9/15/2014			20.5	0.012		0.03								
50	L Bonaparte	9/30/2014			20.5	0.013										
50	L Bonaparte	7/7/2015			20.0	0.013		0.04								
50	L Bonaparte	7/20/2015			20.5	0.048										
50	L Bonaparte	8/3/2015			20.5	0.016		0.03								
50	L Bonaparte	8/18/2015			20.5	0.000										

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH3	TDN	TN/TP	TColor	pH	Cond25	Ca	Chl.a	Cl
50	L Bonaparte	9/1/2015			20.5	0.000		0.36								
50	L Bonaparte	9/14/2015			21.0	0.002										
50	L Bonaparte	9/26/2015			18.5	0.015		0.03								
50.1	L Bonaparte-2	7/30/2007	14.9	4.00	1.5	0.013	0.04	0.01	0.53	91.1	9	7.25	195	25.9	1.88	
50.1	L Bonaparte-2	8/6/2007	14.9	4.00	1.5	0.008	0.01	0.01	0.61	167.9	13	7.21	145	26.1	0.80	
50.1	L Bonaparte-2	8/13/2007	15.0	4.60	1.5	0.007	0.00	0.02	0.47	140.4	14	8.03	165		0.55	
50.1	L Bonaparte-2	8/22/2007	14.8	4.30	1.5	0.006	0.02	0.02	0.59	208.8	1	7.64	201		1.67	
50.1	L Bonaparte-2	8/27/2007	14.7	4.85	1.5	0.006		0.02			14	7.53	146	26.9	2.31	
50.1	L Bonaparte-2	9/3/2007	15.0	4.80	1.5	0.006	0.00	0.02	0.50	185.8	13	7.51	152		1.74	
50.1	L Bonaparte-2	9/11/2007	15.0	4.85	1.5	0.007	0.00	0.01	0.56	168.7	14	8.27	164		2.18	
50.1	L Bonaparte-2	9/17/2007	14.9	5.15	1.5	0.007	0.01	0.01	0.56	192.2	20	7.35	172		1.98	
50.1	L Bonaparte-2	7/30/2007	14.8		13.2	0.010										
50.1	L Bonaparte-2	8/13/2007	15.0		13.5	0.013										
50.1	L Bonaparte-2	8/22/2007	14.8		13.3	0.012										
50.1	L Bonaparte-2	8/27/2007	15.0		13.2	0.011										
50.1	L Bonaparte-2	9/3/2007	15.0		13.2	0.016										
50.1	L Bonaparte-2	9/11/2007	15.0		13.5	0.015										
50.1	L Bonaparte-2	9/17/2007	14.9		13.3	0.020										

LNum	PName	Date	Type	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB form	Shore HAB
50	L Bonaparte	6/21/1988	epi																	
50	L Bonaparte	6/29/1988	epi	13	17															
50	L Bonaparte	7/5/1988	epi	24	21															
50	L Bonaparte	7/12/1988	epi	23	24															
50	L Bonaparte	7/19/1988	epi	24	24															
50	L Bonaparte	7/26/1988	epi	20	23															
50	L Bonaparte	8/2/1988	epi	30	26															
50	L Bonaparte	8/8/1988	epi	27	26															
50	L Bonaparte	8/16/1988	epi	26	24															
50	L Bonaparte	8/23/1988	epi	20	20															
50	L Bonaparte	8/30/1988	epi	16	19															
50	L Bonaparte	9/6/1988	epi	13	18															
50	L Bonaparte	9/12/1988	epi	20	16															
50	L Bonaparte	9/23/1988	epi	14	16															
50	L Bonaparte	9/28/1988	epi	10	15															
50	L Bonaparte	6/23/1989	epi	30	23															
50	L Bonaparte	7/5/1989	epi	28	25															
50	L Bonaparte	7/19/1989	epi	20	23															
50	L Bonaparte	8/2/1989	epi	22	22															
50	L Bonaparte	8/16/1989	epi	21	22															
50	L Bonaparte	8/30/1989	epi	20	20															
50	L Bonaparte	9/13/1989	epi	17	20															
50	L Bonaparte	9/27/1989	epi	12	15															
50	L Bonaparte	7/5/1990	epi	22	22															
50	L Bonaparte	7/18/1990	epi	27	23															
50	L Bonaparte	8/1/1990	epi	25	24															
50	L Bonaparte	8/15/1990	epi	23	22															
50	L Bonaparte	8/29/1990	epi	19	23															
50	L Bonaparte	9/12/1990	epi	26	21															
50	L Bonaparte	9/26/1990	epi	19	15															
50	L Bonaparte	10/10/1990	epi	16	14															
50	L Bonaparte	6/14/1991	epi	23	19															
50	L Bonaparte	6/26/1991	epi	27	23															
50	L Bonaparte	7/14/1991	epi	21	23															
50	L Bonaparte	7/24/1991	epi	25	24															
50	L Bonaparte	8/6/1991	epi	22	17															
50	L Bonaparte	8/20/1991	epi	21	22															
50	L Bonaparte	9/3/1991	epi	24	22															
50	L Bonaparte	9/17/1991	epi	18	20															
50	L Bonaparte	6/3/1992	epi	21	17	1	1	1												
50	L Bonaparte	6/17/1992	epi	26	21	1	1	1												

LNum	PName	Date	Type	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB form	Shore HAB
50	L Bonaparte	7/1/1992	epi	18	20	1	1	1												
50	L Bonaparte	7/15/1992	epi	23	20	2	3	2												
50	L Bonaparte	7/28/1992	epi	20	21	1	2	2												
50	L Bonaparte	8/11/1992	epi	22	21	1	2	2												
50	L Bonaparte	8/25/1992	epi	25	22	2	3	2												
50	L Bonaparte	9/9/1992	epi	22	20	2	2	2												
50	L Bonaparte	7/13/1998	epi	27	23	1	3	1												
50	L Bonaparte	7/27/1998	epi	24	23	1	3	2												
50	L Bonaparte	8/11/1998	epi	25	23	2	3	2												
50	L Bonaparte	8/25/1998	epi	21	22	2	3	2												
50	L Bonaparte	9/8/1998	epi	15	20	2	3	2												
50	L Bonaparte	9/22/1998	epi	12	18	2	3	2												
50	L Bonaparte	6/7/1999	epi	32	22	2	2	1												
50	L Bonaparte	6/28/1999	epi	28	24	1	3	2												
50	L Bonaparte	7/12/1999	epi	22	23	2	3	2												
50	L Bonaparte	7/26/1999	epi	25	26	2	3	2												
50	L Bonaparte	8/9/1999	epi	17	21	2	3	2												
50	L Bonaparte	8/23/1999	epi	21	20	2	3	2	2											
50	L Bonaparte	9/13/1999	epi	18	21	2	3	2	2											
50	L Bonaparte	9/20/1999	epi	16	18	2	3	3	2											
50	L Bonaparte	5/30/2000	epi	23	16	1	2	1	5											
50	L Bonaparte	6/26/2000	epi	26	21	1	2	2												
50	L Bonaparte	7/11/2000	epi	23	20	2	3	2												
50	L Bonaparte	7/24/2000	epi	24	21	2	3	2												
50	L Bonaparte	8/7/2000	epi	29	22	2	3	2												
50	L Bonaparte	8/21/2000	epi	15	20	2	3	3												
50	L Bonaparte	9/5/2000	epi	13	18	2	3	3	2											
50	L Bonaparte	9/18/2000	epi	18	17	2	4	3	2											
50	L Bonaparte	6/5/2001	epi	17	15	1	2	1												
50	L Bonaparte	6/19/2001	epi	25	22	2	3	2												
50	L Bonaparte	7/3/2001	epi	16	19	2	3	3	2											
50	L Bonaparte	7/16/2001	epi	25	20	2	3	3	2											
50	L Bonaparte	7/31/2001	epi	20	23	2	3	3	2											
50	L Bonaparte	8/14/2001	epi	24	25	2	4	3	2											
50	L Bonaparte	8/28/2001	epi	19	22	2	4	3	2											
50	L Bonaparte	9/12/2001	epi	16	21	2	3	3	2											
50	L Bonaparte Site 1	7/30/2007	epi	22		2	3	2	2											
50	L Bonaparte Site 1	8/6/2007	epi	20	24	2	3	3	0											
50	L Bonaparte Site 1	8/13/2007	epi	21	22	2	3	3	2											
50	L Bonaparte Site 1	8/22/2007	epi	16	20	2	3	3	0											
50	L Bonaparte Site 1	8/27/2007	epi	22	21	2	3	3	2											
50	L Bonaparte Site 1	9/3/2007	epi	18	20	2	3	3	0											
50	L Bonaparte Site 1	9/11/2007	epi	18	19	2	3	2	0											
50	L Bonaparte Site 1	9/17/2007	epi	7	17	1	3	1	0											
50	L Bonaparte-1	6/30/2008	epi	22	21	2	3	2	0											
50	L Bonaparte-1	7/15/2008	epi	19	22	1	3	2	0											
50	L Bonaparte-1	7/29/2008	epi	22	22															
50	L Bonaparte-1	8/11/2008	epi	17	21	2	3	2	0											
50	L Bonaparte-1	8/25/2008	epi	18	19	2	3	2	0											
50	L Bonaparte-1	9/11/2008	epi	17	17	2	3	2	0											
50	L Bonaparte-1	9/23/2008	epi	14	19	2	3	2	0											
50	L Bonaparte-1	10/7/2008	epi	10	11	2	3	2	5											
50	L Bonaparte-1	06/08/2009	epi	17	14	1	2	3	5											
50	L Bonaparte-1	06/23/2009	epi	21	21	2	2	2	1											
50	L Bonaparte-1	07/06/2009	epi	23	22	2	2	2	5											
50	L Bonaparte-1	07/20/2009	epi	21	21	2	3	1	0											
50	L Bonaparte-1	08/03/2009	epi	20	23	2	3	2	0											
50	L Bonaparte-1	08/18/2009	epi	25	26	2	2	2	0											
50	L Bonaparte-1	08/31/2009	epi	18	22	2	3	2	0											
50	L Bonaparte-1	09/14/2009	epi	19	21	2	3	2	0			40.03								

LNum	PName	Date	Type	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB form	Shore HAB
50	L Bonaparte	6/15/2010	epi	22	20					4	0									
50	L Bonaparte	6/29/2010	epi	20	22	2	3	2	0	0	0									
50	L Bonaparte	7/12/2010	epi	28	26	2	3	2	0	0	0									
50	L Bonaparte	7/28/2010	epi	25	25	2	3	2	0	0	0									
50	L Bonaparte	8/12/2010	epi	24	25	2	3	2	0	0	0									
50	L Bonaparte	8/31/2010	epi	28	23	2	3	2	0	0	0									
50	L Bonaparte	9/18/2010	epi	15	18	2	3	2	0	0	0									
50	L Bonaparte	10/3/2010	epi	13	16	2	3	3	5	0	0									
50	L Bonaparte	6/6/2011	epi	26	21	1	2	1	0	0	0									
50	L Bonaparte	6/20/2011	epi	25	22	1	2	1	0	0	0	7.60	2.50							
50	L Bonaparte	7/5/2011	epi	25	24	2	3	1	0	0	0	6.90	2.30							
50	L Bonaparte	7/19/2011	epi	27	25	2	3	1	0	0	0	11.40	2.00	0.15						
50	L Bonaparte	8/2/2011	epi	24	25	2	3	2	0	0	0	12.80	2.00							
50	L Bonaparte	8/16/2011	epi	20	24	2	3	2	0	0	0	16.90	2.00	0.15	<0.4	<0.1				
50	L Bonaparte	8/29/2011	epi	16	21	1	3	2	0	0	0	16.50	1.60							
50	L Bonaparte	9/12/2011	epi	24	22	2	3	1	0	0	0	13.70	1.30							
50	L Bonaparte	6/25/2012	epi	19	24	2	3	2	5	0	0			<0.30	<0.428				F	
50	L Bonaparte	7/16/2012	epi	27	26	2	3	2	0	0	0	5.50	0.30	<0.30	<0.392		2.40	1.10	I	
50	L Bonaparte	7/30/2012	epi	26	25	2	3	2	0	0	0	4.70	0.40	<0.30	<0.292		1.91	0.98	FI	
50	L Bonaparte	8/13/2012	epi	24	25	2	3	2	0	0	0	19.50	0.70	0.35	<0.552					
50	L Bonaparte	8/28/2012	epi	21	24	2	3	2	0	0	0	5.70	0.30	<0.30	<0.551		1.95	1.38	I	
50	L Bonaparte	9/10/2012	epi	14	20	2	3	2	0	0	0	4.00	0.20	0.46	<3.299		2.27	1.62	I	
50	L Bonaparte	9/24/2012	epi	10	18	2	3	2	0	0	0	14.40	0.40	<0.30	<3.205		3.25	2.09	I	
50	L Bonaparte	10/11/2012	epi	9	14	2	3	2	0	0	0	7.40	0.40	<0.30	<3.205		2.21	0.90		
50	L Bonaparte	6/10/2013	epi	21	19	2	2	2	0	0	0			<0.30	<0.440		1.00	0.00		
50	L Bonaparte	6/24/2013	epi	27	24	2	2	2	0	0	0	2.90	1.20	<0.30	<0.410		1.80	0.20	I	
50	L Bonaparte	7/8/2013	epi	22	25	2	2	2	0	0	0	4.30	1.50	<0.30	<0.510		3.20	1.00	I	
50	L Bonaparte	7/23/2013	epi	24	26	2	3	2	0	0	0	6.40	1.00	<0.30	<0.370		2.70	0.00	I	
50	L Bonaparte	8/6/2013	epi	20	23	2	3	2	0	0	0	5.80	1.00	4.34	<0.400		2.70	1.20	I	
50	L Bonaparte	8/19/2013	epi	27	23	2	3	2	0	0	0	6.00	1.10	<0.30	<0.510		1.70	1.10	I	
50	L Bonaparte	9/2/2013	epi	22	24	1	2	2	0	0	0	11.90	0.70	<0.30	<1.100		2.00	1.00	I	
50	L Bonaparte	9/17/2013	epi	7	15	2	2	1	0	0	0	32.60	1.10	<0.30	<19.130		6.00	4.30		
50	L Bonaparte	6/23/2014	epi	26	22	1	3	1	0	0	0			<0.47	<0.44	<0.002	3.10	0.80		
50	L Bonaparte	7/8/2014	epi	28	23	2	3	2	0	4	4	6.10	0.40	<0.40	<0.48	<0.001	2.10	0.30	i	
50	L Bonaparte	7/22/2014	epi	27	24	2	3	1	0	0	0	6.30	0.30	<0.39	<0.24	<0.002	1.90	0.30	i	i
50	L Bonaparte	8/5/2014	epi	24	24	2	3	2	0	0	0	3.10	0.20	<0.38	<0.05	<0.001	1.00	0.30	i	i
50	L Bonaparte	8/19/2014	epi	27	22	2	3	1	0	0	0	4.10	0.10	<0.26	<0.10	<0.002	1.00	0.00	i	i
50	L Bonaparte	9/1/2014	epi	25	23	2	3	1	0	0	0	3.20	0.10	<0.24	<0.03	<0.001	0.40	0.00	i	i
50	L Bonaparte	9/15/2014	epi	12	20	2	3	2	5	0	0	8.90	0.20	<0.24	<0.03	<0.001	1.70	0.30	i	i
50	L Bonaparte	9/30/2014	epi	20	19	2	3	1	0	0	0	4.10	0.20	<0.59	<0.85	<0.001	1.30	0.30	i	i
50	L Bonaparte	7/7/2015	epi	23	23	2	2	2	0	0	0	5.20	0.30	<0.71	<0.003	<0.011	1.35	0.00	I	I
50	L Bonaparte	7/20/2015	epi	25	24	2	2	2	0	0	0	5.10	0.30	<0.36	<0.003	<0.018	1.65	0.00	I	I
50	L Bonaparte	8/3/2015	epi	23	25	2	3	1	0	0	0	19.02	0.28	<0.18	<0.002	<0.009	0.74	0.00	I	I
50	L Bonaparte	8/18/2015	epi	29	25	2	3	2	0	0	0	7.50	0.40	<0.33	<0.006	<0.024	0.76	0.12	I	I
50	L Bonaparte	9/1/2015	epi	22	23	2	3	2	0	0	0	7.50	0.30	<0.45	<0.031	<0.028	0.92	0.25	I	I
50	L Bonaparte	9/14/2015	epi	16	22	2	3	4	5	0	0	6.40	0.30	<0.27	<0.009	<0.022	1.74	0.70	I	I
50	L Bonaparte	9/26/2015	epi	15	21	2	3	1	0	0	0	3.80	0.30	<0.30	<0.007	<0.035	0.68	0.00	I	I
50	L Bonaparte	9/22/1998	hypo		7															
50	L Bonaparte	7/27/1998	hypo		7															
50	L Bonaparte	8/25/1998	hypo		9															
50	L Bonaparte Site 1	7/30/2007	hypo		8															
50	L Bonaparte Site 1	8/13/2007	hypo		7															
50	L Bonaparte Site 1	8/22/2007	hypo		8															
50	L Bonaparte Site 1	8/27/2007	hypo		8															
50	L Bonaparte Site 1	9/3/2007	hypo		8															
50	L Bonaparte Site 1	9/11/2007	hypo		7															
50	L Bonaparte Site 1	9/17/2007	hypo		7															
50	L Bonaparte-1	6/30/2008	hypo		7															
50	L Bonaparte-1	7/15/2008	hypo		7															
50	L Bonaparte-1	7/29/2008	hypo		8															

LNum	PName	Date	Type	TAir	TH20	QA	QB	QC	QD	QF	QG	AQ-PC	AQ-Chla	MC-LR	Ana-a	Cyl	FP-Chl	FP-BG	HAB form	Shore HAB
50	L Bonaparte-1	8/11/2008	hypo		7															
50	L Bonaparte-1	8/25/2008	hypo		7															
50	L Bonaparte-1	9/11/2008	hypo		8															
50	L Bonaparte-1	9/23/2008	hypo		8															
50	L Bonaparte-1	10/7/2008	hypo		4															
50	L Bonaparte-1	06/08/2009	hypo		7															
50	L Bonaparte-1	06/23/2009	hypo		9															
50	L Bonaparte-1	07/06/2009	hypo		9															
50	L Bonaparte-1	07/20/2009	hypo		9															
50	L Bonaparte-1	08/03/2009	hypo		10															
50	L Bonaparte-1	08/18/2009	hypo		10															
50	L Bonaparte-1	08/31/2009	hypo		10															
50	L Bonaparte-1	09/14/2009	hypo		9															
50	L Bonaparte	6/6/2011	hypo		10															
50	L Bonaparte	7/5/2011	hypo		12															
50	L Bonaparte	8/2/2011	hypo		11															
50	L Bonaparte	8/29/2011	hypo		10															
50	L Bonaparte	7/30/2012	hypo		11															
50	L Bonaparte	8/28/2012	hypo		10															
50	L Bonaparte	9/24/2012	hypo		9															
50	L Bonaparte	6/10/2013	hypo		10															
50	L Bonaparte	7/8/2013	hypo		10															
50	L Bonaparte	8/6/2013	hypo		13															
50	L Bonaparte	9/2/2013	hypo		14															
50	L Bonaparte	6/23/2014	hypo		9															
50	L Bonaparte	7/8/2014	hypo		9															
50	L Bonaparte	7/22/2014	hypo		9															
50	L Bonaparte	8/5/2014	hypo		9															
50	L Bonaparte	8/19/2014	hypo		9															
50	L Bonaparte	9/1/2014	hypo		10															
50	L Bonaparte	9/15/2014	hypo		19															
50	L Bonaparte	9/30/2014	hypo		19															
50	L Bonaparte	7/7/2015	hypo		9															
50	L Bonaparte	7/20/2015	hypo		9															
50	L Bonaparte	8/3/2015	hypo		8															
50	L Bonaparte	8/18/2015	hypo		8															
50	L Bonaparte	9/1/2015	hypo		8															
50	L Bonaparte	9/14/2015	hypo		8															
50	L Bonaparte	9/26/2015	hypo		9															
50	L Bonaparte	7/7/2015	hypo		9															
50-1	L Bonaparte Site 2	8/6/2007	hypo		24															
50-1	L Bonaparte Site 2	8/13/2007	hypo		23															
50-1	L Bonaparte Site 2	8/22/2007	hypo		20															
50-1	L Bonaparte Site 2	8/27/2007	hypo		21															
50-1	L Bonaparte Site 2	9/3/2007	hypo		20															
50-1	L Bonaparte Site 2	9/11/2007	hypo		19															
50-1	L Bonaparte Site 2	9/17/2007	hypo		17															

Legend Information

Indicator	*Description*	*Detection Limit*	*Standard (S) / Criteria (C)*
General Information			
Lnum	lake number (unique to CSLAP)		
Lname	name of lake (as it appears in the Gazetteer of NYS Lakes)		
Date	sampling date		
Field Parameters			
Zbot	lake depth at sampling point, meters (m)		
Zsd	Secchi disk transparency or clarity	0.1m	1.2m (C)
Zsamp	water sample depth (m) (epi = epilimnion or surface; bot = bottom)	0.1m	none
Tair	air temperature (C)	-10C	none
TH20	water temperature (C)	-10C	none
Laboratory Parameters			
Tot.P	total phosphorus (mg/l)	0.003 mg/l	0.020 mg/l (C)
NOx	nitrate + nitrite (mg/l)	0.01 mg/l	10 mg/l NO3 (S), 2 mg/l NO2 (S)
NH4	total ammonia (mg/l)	0.01 mg/l	2 mg/l NH4 (S)
TN	total nitrogen (mg/l)	0.01 mg/l	none
TN/TP	nitrogen to phosphorus (molar) ratio, = (TKN + NOx)*2.2/TP		none
TCOLOR	true (filtered) color (ptu, platinum color units)	1 ptu	none
pH	powers of hydrogen (S.U., standard pH units)	0.1 S.U.	6.5, 8.5 S.U. (S)
Cond25	specific conductance, corrected to 25C (umho/cm)	1 umho/cm	none
Ca, Cl	calcium, chloride (mg/l)	1 mg/l	none
Chl.a	chlorophyll a (ug/l)	0.01 ug/l	none
Fe	iron (mg/l)	0.1 mg/1	1.0 mg/l (S)
Mn	manganese (mg/l)	0.01 mg/l	0.3 mg/l (S)
As	arsenic (ug/l)	1 ug/l	10 ug/l (S)
AQ-PC	Phycocyanin (aquaflor) (unitless)	1 unit	none
AQ-Chl	Chlorophyll *a* (aquaflor) (ug/l)	1 ug/l	none
MC-LR	Microcystis-LR (ug/l)	0.01 ug/l	1 ug/l potable (C) 20 ug/l swimming (C)
Ana	Anatoxin-a (ug/l)	variable	none
Cyl	Cylindrospermposin (ug/l)	0.1 ug/l	none
FP-Chl, FP-BG	Fluoroprobe total chlorophyll, fluoroprobe blue-green chlorophyll (ug/l)	0.1 ug/l	none
Lake Assessment			
QA	water quality assessment; 1 = crystal clear, 2 = not quite crystal clear, 3 = definite algae greenness, 4 = high algae levels, 5 = severely high algae levels		
QB	aquatic plant assessment; 1 = no plants visible, 2 = plants below surface, 3 = plants at surface, 4 = plants dense at surface, 5 = surface plant coverage		
QC	recreational assessment; 1 = could not be nicer, 2 = excellent, 3 = slightly impaired, 4 = substantially impaired, 5 = lake not usable		
QD	reasons for recreational assessment; 1 = poor water clarity, 2 = excessive weeds, 3 = too much algae, 4 = lake looks bad, 5 = poor weather, 6 = litter/surface debris, 7 = too many lake users, 8 = other		
QF, QG	Health and safety issues today (QF) and past week (QG); 0 = none, 1 = taste/odor, 2 = GI illness humans/animals, 3 = swimmers itch, 4 = algae blooms, 5 = dead fish, 6 = unusual animals, 7 = other		
HAB form, Shore HAB	HAB evaluation; A = spilled paint, B = pea soup, C = streaks, D = green dots, E = bubbling scum, F = green/brown tint, G = duckweed, H = other, I = no bloom		

Appendix B: Priority Waterbody Listing for Lake Bonaparte

Lake Bonaparte (0906-0016) — MinorImpacts

Waterbody Location Information

Revised: 11/21/2008

Water Index No:	SL-25- 7/P1- 3-55-P24	**Drain Basin:**	Saint Lawrence River
Hydro Unit Code:	04150303/010 **Str Class:** B		Indian River
Waterbody Type:	Lake	**Reg/County:**	6/Lewis Co. (25)
Waterbody Size:	1274.7 Acres	**Quad Map:**	LAKE BONAPARTE (E-19-1)
Seg Description:	entire lake		

Water Quality Problem/Issue Information

(CAPS indicate MAJOR Use Impacts/Pollutants/Sources)

Use(s) Impacted	Severity	Problem Documentation
Public Bathing	Stressed	Suspected
Recreation	Stressed	Suspected
Habitat/Hydrolgy	Stressed	Suspected

Type of Pollutant(s)

Known: ALGAL/WEED GROWTH (Eurasian milfoil)
Suspected: - - -
Possible: - - -

Source(s) of Pollutant(s)

Known: - - -
Suspected: HABITAT MODIFICATION (invasive plants)
Possible: - - -

Resolution/Management Information

Issue Resolvability: 1 (Needs Verification/Study (see STATUS))
Verification Status: 4 (Source Identified, Strategy Needed)
Lead Agency/Office: ext/WQCC **Resolution Potential:** Medium
TMDL/303d Status: n/a

Further Details

Overview

Recreational uses (swimming, boating, etc) in Lake Bonaparte are thought to experience minor impacts/threats due to excessive aquatic weed growth. Invasive aquatic plants (Eurasian milfoil) have been identified in the lake.

Water Quality Sampling

Lake Bonaparte has been sampled as part of the NYSDEC Citizen Statewide Lake Assessment Program (CSLAP) beginning in 1986 and continuing through 2001. An Interpretive Summary report of the findings of this sampling was published in 2002. These data indicate that the lake continues to be best characterized as oligotrophic, or highly unproductive. This level of productivity is somewhat lower than was found in previous year sampling. Phosphorus levels in the lake fall well below the state guidance values indicating impacted/stressed recreational uses. Corresponding transparency measurements meet what is the recommended minimum for swimming beaches. Measurements of pH typically fall within the state water quality range of 6.5 to 8.5, with occasionally high pH readings. The lake water is weakly colored and color does not limit water transparency. (DEC/DOW, BWAM/CSLAP, September 2002)

Recreational Assessment

Public perception of the lake and its uses is also evaluated as part of the CSLAP program. This assessment indicates recreational suitability of the lake to be somewhat favorable, but less so in more recent years. The recreational suitability of the lake is described most frequently as "excellent," though more recently descriptions of "slightly" impacted appear. The lake itself is most often described as "not quite crystal clear," an assessment that is slightly less favorable than expected given measured water quality characteristics. Assessments have noted that aquatic plants grow to the lake surface and at times at dense. In fact "excessive weed growth" is the most frequently cited reason for recreational impacts. It is suspected that the aquatic plant community, and impacts associated with invasive plant growth, is dominated by Eurasian watermilfoil. (DEC/DOW, BWAM/CSLAP, September 2002)

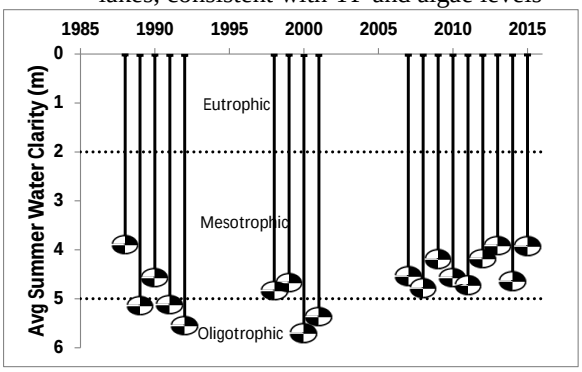
Lake Uses

This lake waterbody is designated class B, suitable for use as a public bathing beach, general recreation and aquatic life support, but not as a public water supply. Water quality monitoring by NYSDEC focuses primarily on support of general recreation and aquatic life. Samples to evaluate the bacteriological condition and bathing use of the lake or to evaluate contamination from organic compounds, metals or other inorganic pollutants have not been collected as part of the CSLAP monitoring program. Monitoring to assess potable water supply and public bathing use is generally the responsibility of state and/or local health departments.

Appendix C- Long Term Trends: Lake Bonaparte

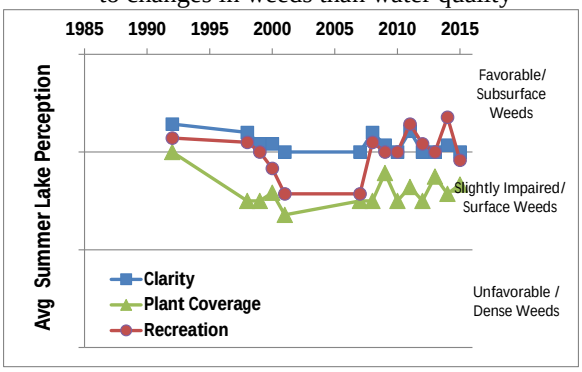
Long Term Trends: Water Clarity

- Decrease 2000 to 2015
- Most readings typical of *mesoligotrophic* lakes, consistent with TP and algae levels



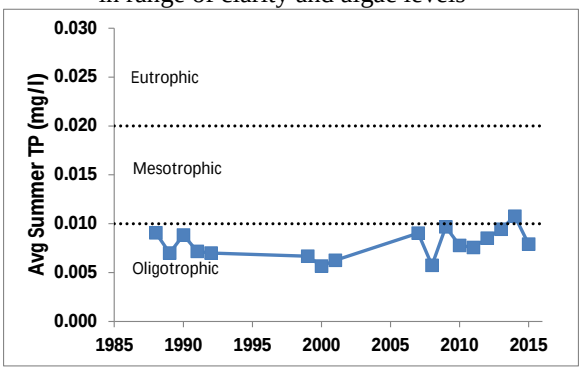
Long Term Trends: Lake Perception

- No trends apparent; fairly stable most years
- Recreational perception more closely linked to changes in weeds than water quality



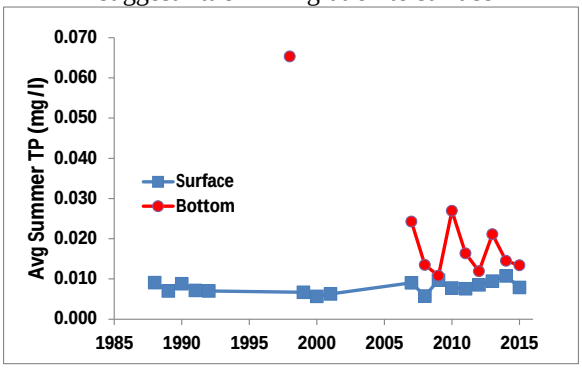
Long Term Trends: Phosphorus

- Slight increase since 2008, but lower in '15
- Most readings typical of *oligotrophic* lakes, in range of clarity and algae levels



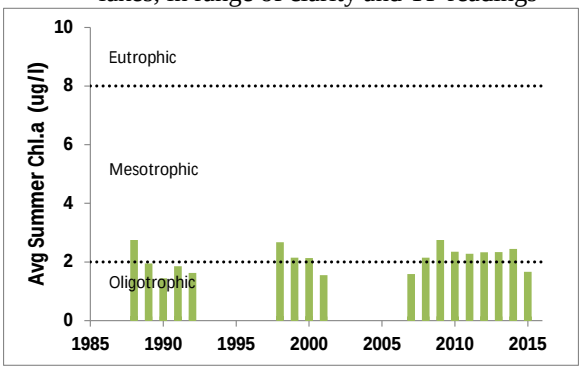
Long Term Trends: Bottom Phosphorus

- Slightly higher bottom than surface TP
- Bottom TP readings and strong thermal layer suggest little TP migration to surface



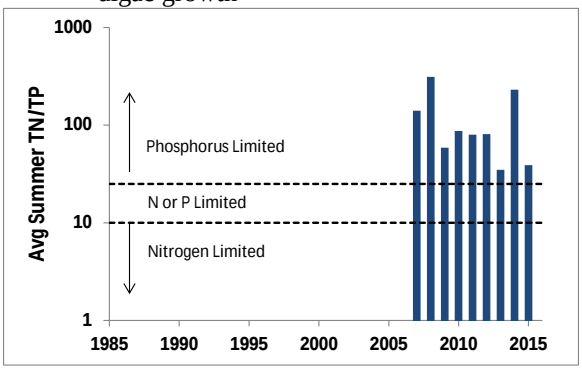
Long Term Trends: Chlorophyll a

- No trends apparent
- Most readings typical of *mesoligotrophic* lakes, in range of clarity and TP readings



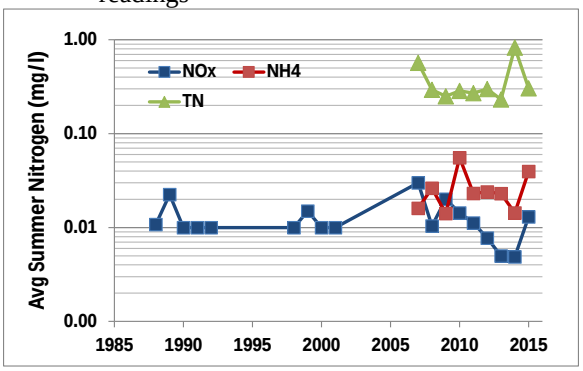
Long Term Trends: N:P Ratio

- May have decreased since late 2000s
- Most readings indicate phosphorus limits algae growth



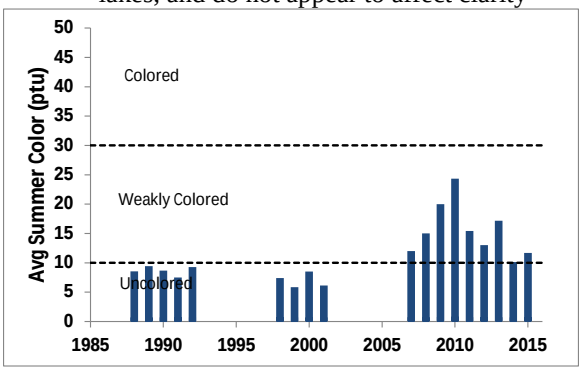
Long Term Trends: Nitrogen

- NOx ↓ 2007-14, but no trends NH4 or TN
- Low NOx, ammonia and total nitrogen readings



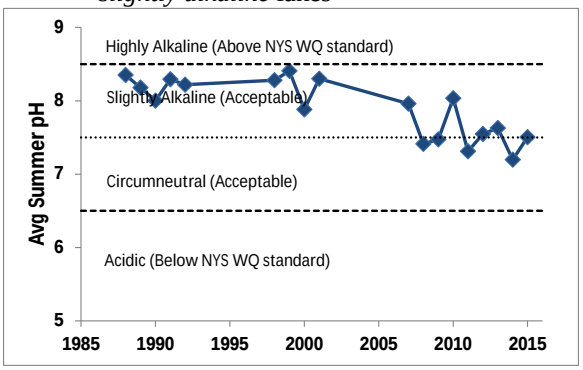
Long Term Trends: Color

- Higher color since '02- likely due to lab
- Most readings typical of *weakly colored* lakes, and do not appear to affect clarity



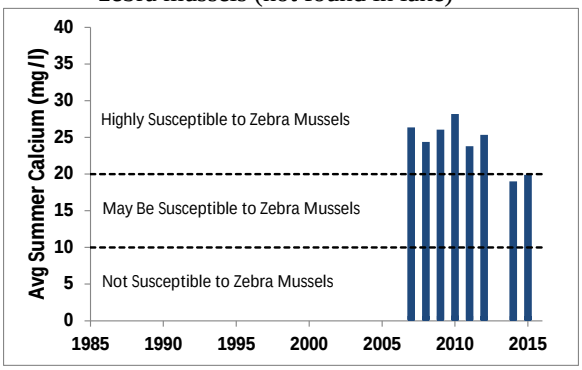
Long Term Trends: pH

- pH decreasing significantly since early 00s
- Most readings typical of *circumneutral* to *slightly alkaline* lakes



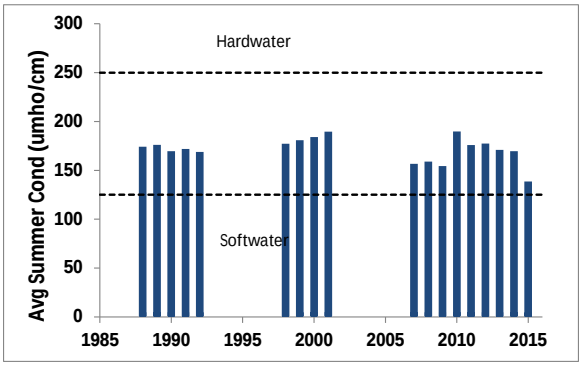
Long Term Trends: Calcium

- Lower calcium levels last few years
- Most readings indicate high susceptibility to zebra mussels (not found in lake)



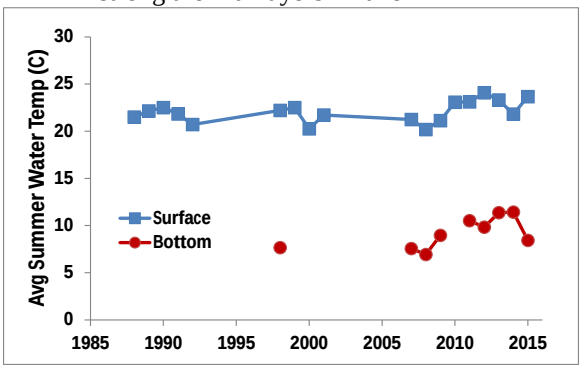
Long Term Trends: Conductivity

- No trends apparent; mostly stable yr to yr
- Most readings typical of lakes with *intermediate hardness*



Long Term Trends: Water Temperature

- No change in surface T; increasing bottom T
- Much colder bottom temperatures indicates strong thermal layers in lake



Appendix D:
Algae Testing Results from SUNY ESF Study

Most algae are harmless, naturally present, and an important part of the food web. However excessive algae growth can cause health, recreational, and aesthetic problems. Some algae can produce toxins that can be harmful to people and animals. High quantities of these algae are called harmful algal blooms (HABs). CSLAP lakes have been sampled for a variety of HAB indicators since 2008. This was completed on selected lakes as part of a NYS DOH study from 2008-2010. In 2011, enhanced sampling on all CSLAP lakes was initiated through an EPA-funded project that has continued through the current sampling season. This study has evaluated a number of HAB indicators as follows:

- Algae types - blue green, green, diatoms, and "other"
- Algae densities
- Microscopic analysis of bloom samples
- Algal toxin analysis

Some of these results are reported in other portions of these reports. This appendix the seasonal change in blue green algae, other algae types, and the primary algal toxin (microcystin-LR, a liver toxin). Analysis was completed on open water samples and, for some lakes, shoreline samples that were collected when visual evidence of blooms were apparent. Results are compared to the DEC criteria of 25-30 ug/l blue green chlorophyll a and 20 ug/l microcystin-LR (based on the World Health Organization (WHO) threshold for unsafe swimming conditions) and the WHO provisional criteria for long-term protection of treated water supplies (= 1 ug/l microcystin-LR). The data for algae types are drawn from a high end fluorometer used by SUNY ESF. While these results are useful for timely approximation of lake conditions, they are not as accurate as the total chlorophyll results measured as a regular part of CSLAP since 1986 in all open water samples. Therefore these results are used judiciously in the assessment of sampled waterbodies.

Two separate samples are evaluated. A sample is taken at the CSLAP sample point at the deepest point of the lake at every sample session. In addition, shoreline samples can be taken when a bloom is visible. It should be noted that shoreline conditions can vary significantly over time and from one location to another. The shoreline bloom sampling results summarized below are not collected as routinely as open water samples, and therefore represent snapshots in time. It is assumed that sampling results showing high blue green algae and/or toxin levels indicate that algae blooms may be common and/or widespread on these lakes. However, the absence of elevated blue green algae and toxin levels does not assure the lack of shoreline blooms on these lakes. Elevated open water readings may indicate a higher likelihood of shoreline blooms, but in some lakes, these shoreline blooms have not been (well) documented.

The results from these samples are summarized within the CSLAP report for the lake.

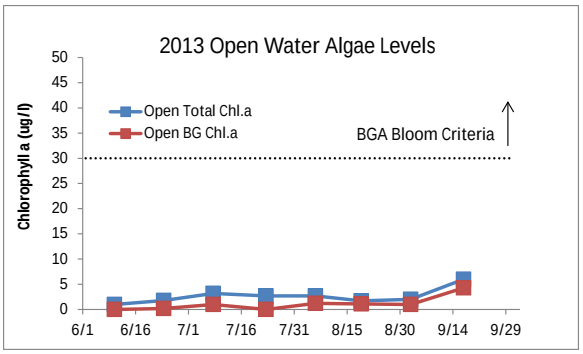


Figure D1:
2013 Open Water Total and BGA Chl.a

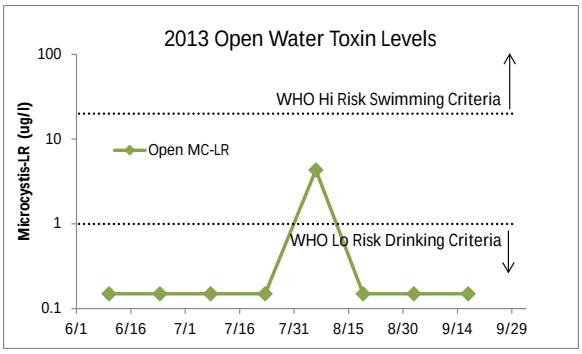


Figure D2:
2013 Open Water Microcystin-LR

Figure D3:
2013 Shoreline Total and BGA Chl.a

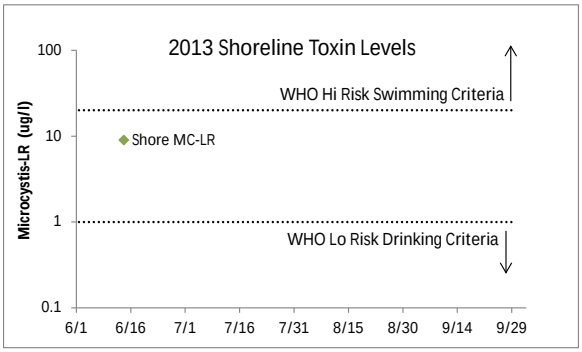


Figure D4:
2013 Shoreline Microcystin-LR

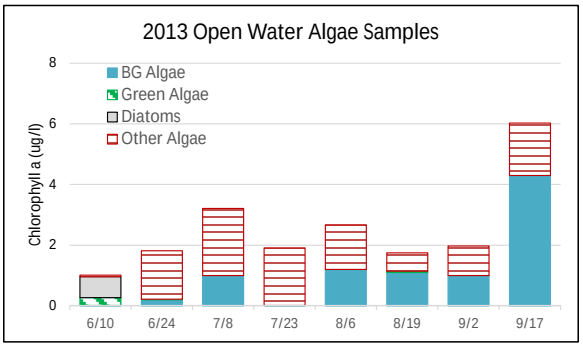


Figure D5:
2013 Open Water Algae Types

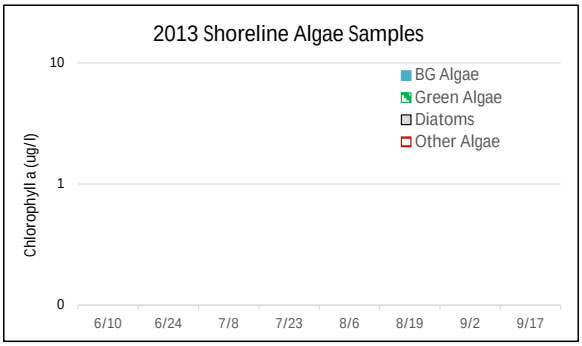


Figure D6:
2013 Shoreline Algae Types

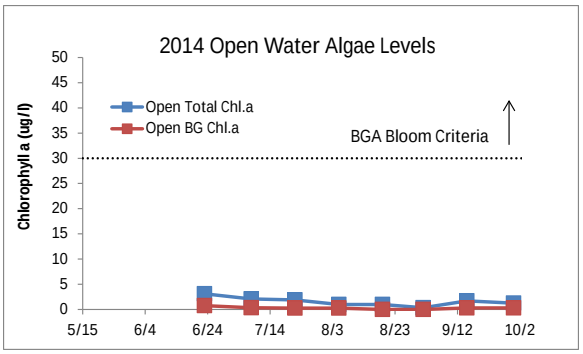


Figure D7:
2014 Open Water Total and BGA Chl.a

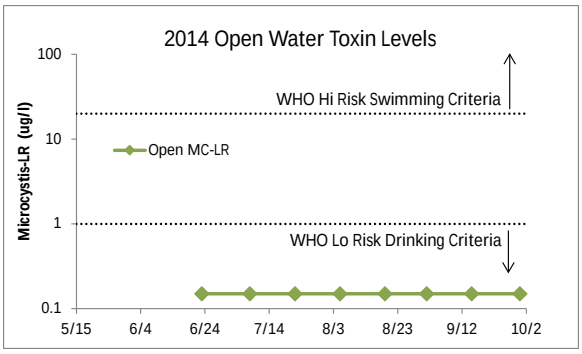


Figure D8:
2014 Open Water Microcystin-LR

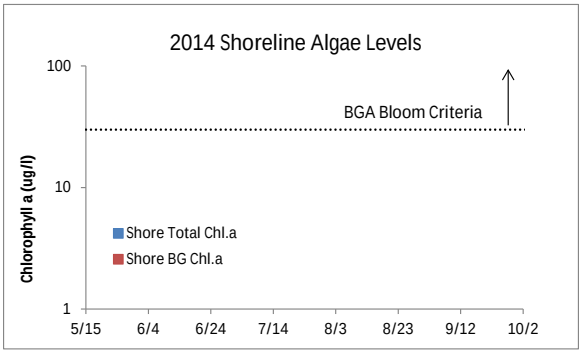


Figure D9:
2014 Shoreline Total and BGA Chl.a

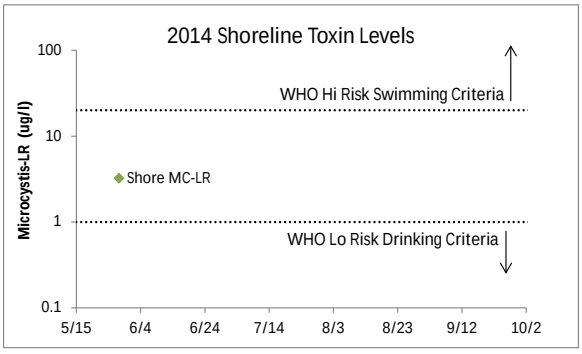


Figure D10:
2014 Shoreline Microcystin-LR

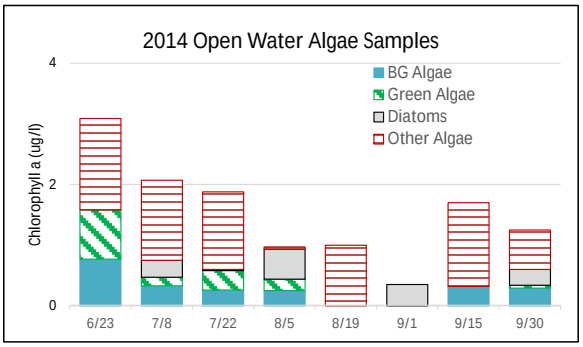


Figure D11:
2014 Open Water Algae Types

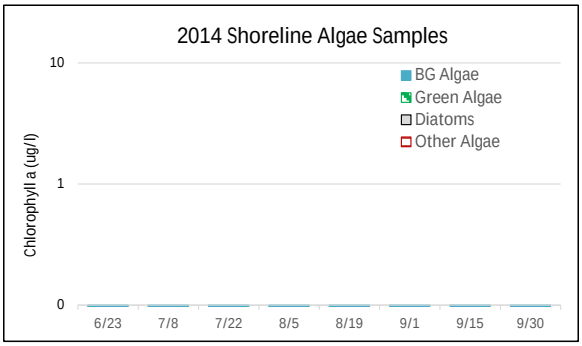


Figure D12:
2014 Shoreline Algae Types

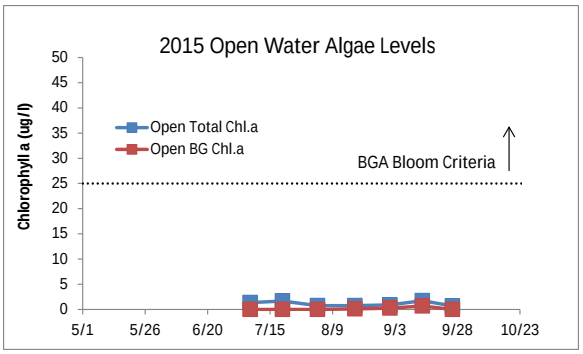


Figure D13:
2015 Open Water Total and BGA Chl.a

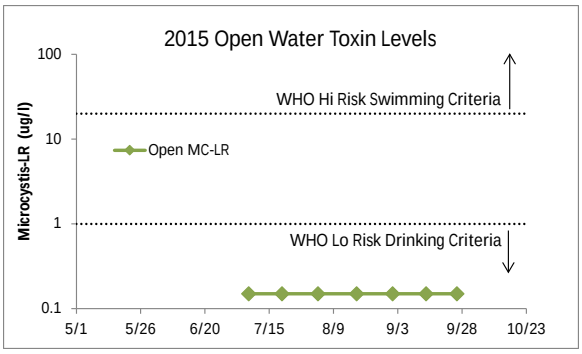


Figure D14:
2015 Open Water Microcystin-LR

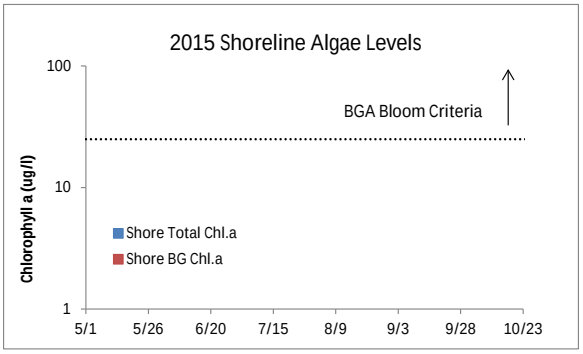


Figure D15:
2015 Shoreline Total and BGA Chl.a

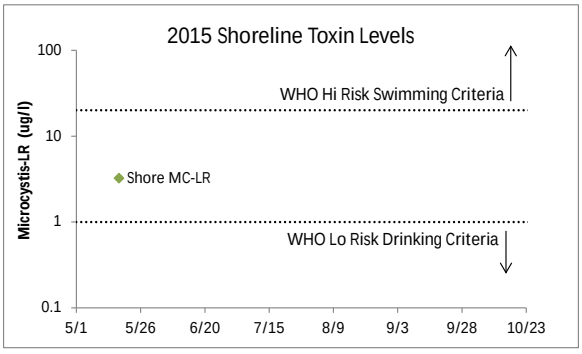


Figure D16:
2015 Shoreline Microcystin-LR

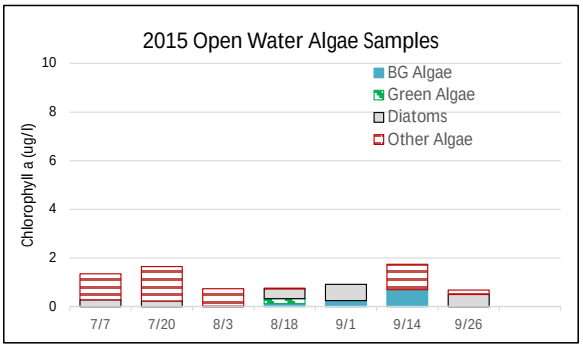


Figure D17:
2015 Open Water Algae Types

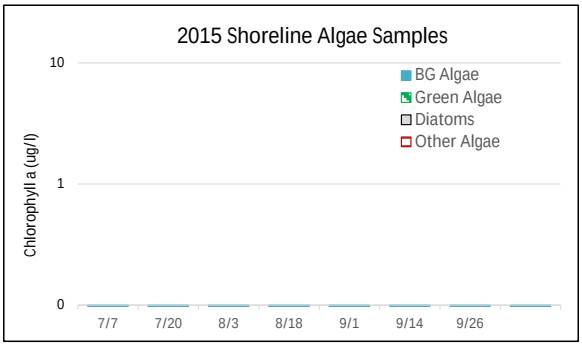


Figure D18:
2015 Shoreline Algae Types

Appendix E:
AIS Species in Lewis County

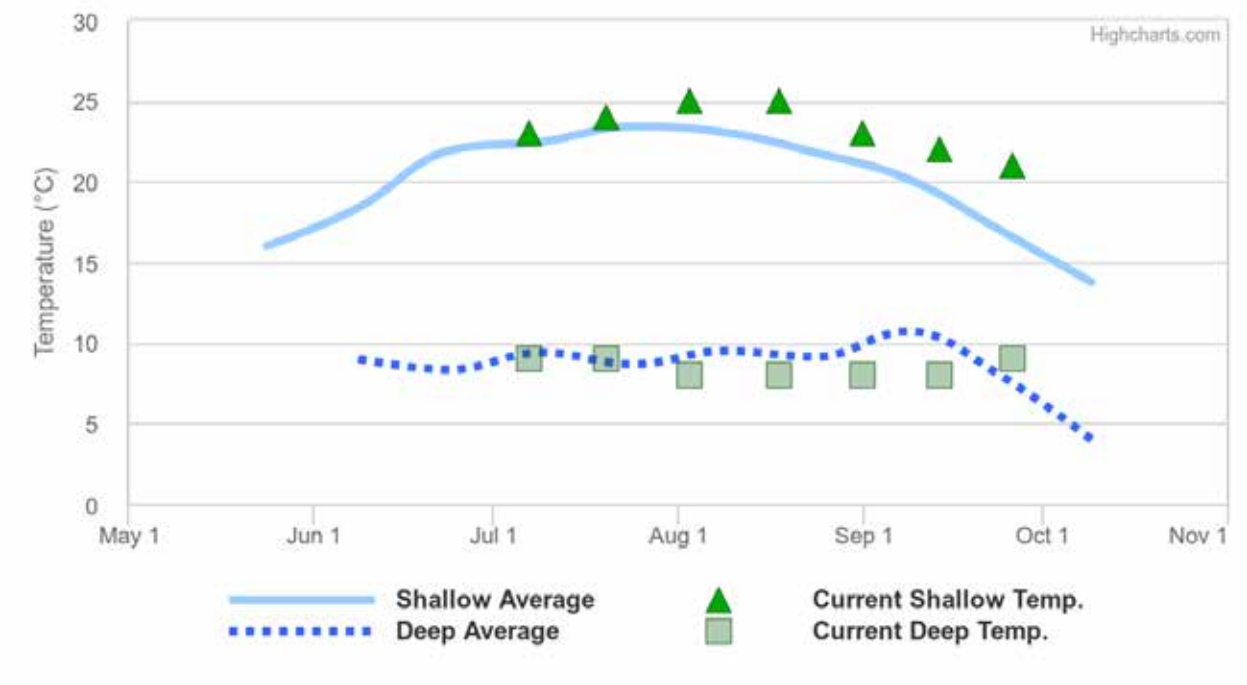
The table below shows the invasive aquatic plants and animals that have been documented in Lewis County, as cited in either the iMapInvasives database (http://www.imapinvasives.org/) or in the NYSDEC Division of Water database. These databases may include some, but not all, non-native plants or animals that have not been identified as "Prohibited and Regulated Invasive Species" in New York state regulations (6 NYCRR Part 575; http://www.dec.ny.gov/docs/lands_forests_pdf/islist.pdf).

This list is not complete, but instead represents only those species that have been reported and verified within the county. If any additional aquatic invasive species (AIS) are known or suspected in these or other waterbodies in the county, this information should be reported through iMap invasives or by contacting NYSDEC at dowinfo@dec.ny.gov.

Aquatic Invasive Species - Lewis County			
Waterbody	**Kingdom**	**Common name**	**Scientific name**
Effley Falls Pond	Animal	Mud bithynia snail	*Bithynia tentaculata*
Lake Bonaparte	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Soft Maple Reservoir	Plant	Variable watermilfoil	*Myriophyllum heterophyllum*

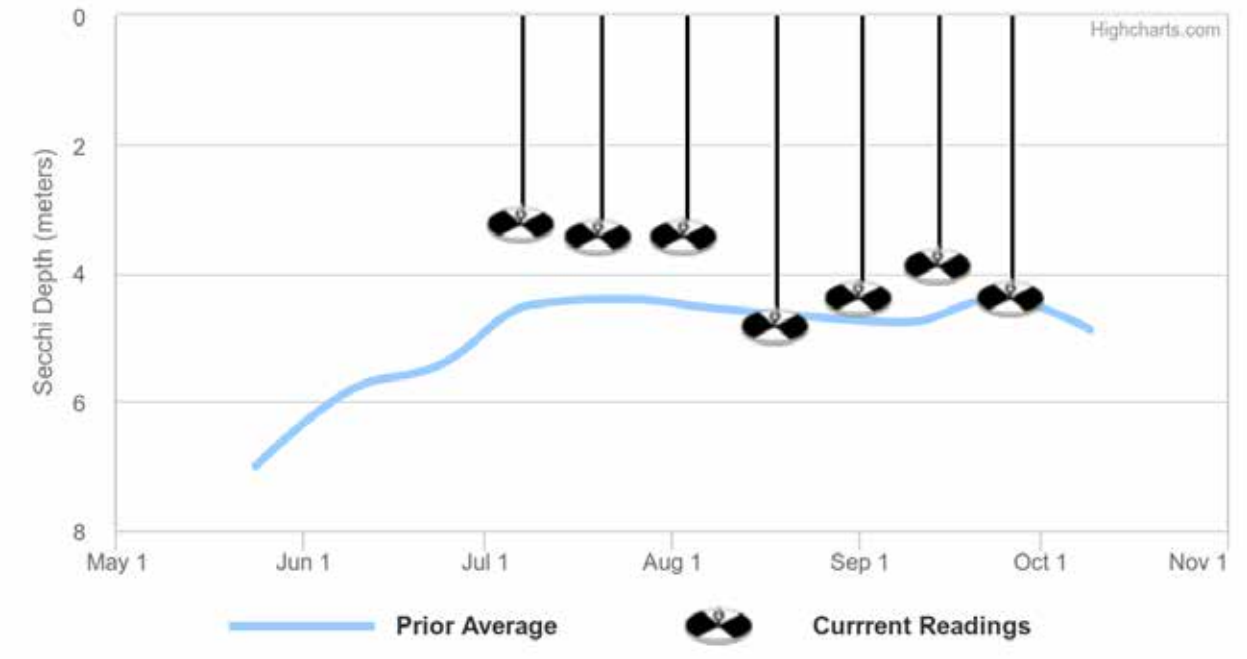
Appendix F: Current Year vs. Prior Averages for Lake Bonaparte

Current Year Water Temperatures vs. Prior Average



This year's shallow water sample temperatures are tending to be higher than normal when compared to the average of readings collected from 1988 to 2014. This year's deep water sample temperatures are about the same as the average of readings collected from 1998 to 2014.

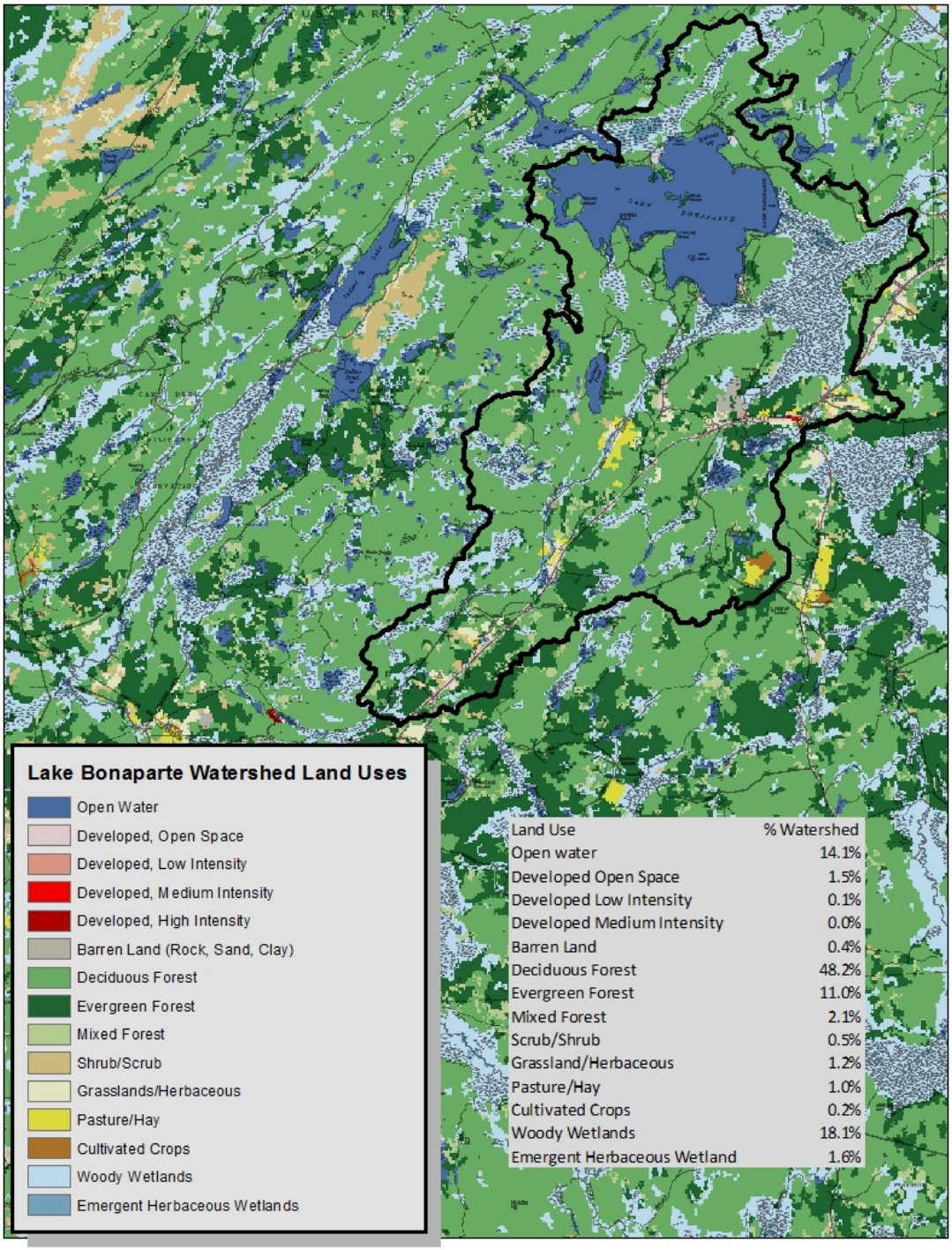
Current Year Secchi Readings vs. Prior Average



This year's session Secchi readings are tending to be lower than normal when compared to the average of readings collected from 1988 to 2014

Appendix G: Watershed and Land Use Map for Lake Bonaparte

This watershed and land use map was developed using USGS StreamStats and ESRI ArcGIS using the 2006 land use satellite imagery. The actual watershed map and present land uses within this watershed may be slightly different due to the age of the underlying data and some limits to the use of these tools in some geographic regions and under varying flow conditions. However, these maps are intended to show the approximate extent of the lake drainage basin and the major land uses found within the boundaries of the basin.



Land Use	% Watershed
Open water	14.1%
Developed Open Space	1.5%
Developed Low Intensity	0.1%
Developed Medium Intensity	0.0%
Barren Land	0.4%
Deciduous Forest	48.2%
Evergreen Forest	11.0%
Mixed Forest	2.1%
Scrub/Shrub	0.5%
Grassland/Herbaceous	1.2%
Pasture/Hay	1.0%
Cultivated Crops	0.2%
Woody Wetlands	18.1%
Emergent Herbaceous Wetland	1.6%