CSLAP 2015 Lake Water Quality Summary:
Findley Lake

General Lake Information

Location	Town of Findley Lake
County	Chautauqua
Basin	Allegheny River
Size	124.3 hectares (307.0 acres)
Lake Origins	Natural
Watershed Area	1,240 hectares (3,063 acres)
Retention Time	0.5 years
Mean Depth	3.3 meters
Sounding Depth	11.7 meters
Public Access?	cartop launch
Major Tributaries	West Branch French Creek
Lake Tributary To…	Findley Lake outlet to West Branch French Creek to Allegheny River
WQ Classification	B (contact recreation = swimming)
Lake Outlet Latitude	42.119
Lake Outlet Longitude	-79.734
Sampling Years	1986-2000, 2003-2013, 2015
2014 Samplers	Scott Johnson
Main Contact	Scott Johnson

Lake Map

Background

Findley Lake is a 307 acre, class B lake found in the Town of Findley Lake in Chautauqua County, in western New York State. It has first sampled as part of CSLAP in 1986.

It is one of three CSLAP lakes among the more than 130 lakes and ponds found in Chautauqua County, and one of five CSLAP lakes among the nearly 300 lakes and ponds in the Allegheny River drainage basin.

Lake Uses

Findley Lake 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 and a cartop boat launch.

It is not known by the report authors if private fish stocking occurs in Findley Lake. The state usually stocks about 1000 9 to 10 inch tiger muskellunge in the lake, and about 5500 four inch walleye were stocked several years ago. Fish species in the lake include bluegill, carp, muskellunge, northern pike, smallmouth bass, pumpkinseed sunfish, walleye, and yellow perch.

General statewide fishing regulations are applicable in Findley Lake. In addition, open season on walleye lasts from the 1st Saturday in May through March 15, with an 18 inch size limit and a take limit of three fish. Ice fishing is allowed.

Historical Water Quality Data

CSLAP sampling was conducted on Findley Lake from 1986 to 2000, 2003 to 2013, and in 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 Findley Lake can also be found on the NYSDEC web page at http://www.dec.ny.gov/lands/77881.html.

Findley Lake was sampled by the NYSDEC as part of the state ambient lake monitoring program (referred to as the LCI, or Lake Classification and Inventory Survey) in 1976 and 1985. These sampling programs indicated water quality conditions that were probably similar to those measured through CSLAP- the lake was less productive in 1985 (with nutrient and clarity readings similar to those measured in 2003 and 2004), and more productive in 1976. Conductivity readings have steadily increased from the 1970s sampling to the present day, but this has also occurred in most NYS lakes, and at present the increase in conductivity has not been connected to any other water quality changes.

Findley Lake was also sampled in 1937 as part of the Conservation Department (predecessor to the NYSDEC) Biological Survey of the Allegheny River basin. This survey showed slightly higher pH than in the typical CSLAP (or other contemporary monitoring program) sampling season, and oxygen deficits starting at a depth between 15 and 20 feet from the lake surface. The field notes for the 1937 survey included the following:

"*This, the westernmost lake in New York State, is a very irregularly shaped body of water with numerous shallow bays and several islands. The level is maintained by a dam at the north end. A large part of the south end is a shallow area with flat bottom covered with a thick growth of hornwort, waterweed, and Robbins pondweed. These plants cover almost the entire bottom and* *apparently have been the most successful invaders of what was once a wooded area, as evidenced by the numerous large submerged stumps. In this same weed bed are found many plants of the broad-leaved pondweed (P.amplifolius), of naiad and bladderwort, as well as the ubiquitous waterlilies and water shield. Along the marshy shore, at the south end of the lake, are extensive marshes of cattail and large floating masses of water smartweed. Other large weed beds were found at the north end of the lake and along the east side.*

Findley Lake has very poor bottom chemical conditions in the face of which it will be difficult if not impossible to improve production by stocking alone. To form the present lake, an 8-foot dam was built across the outlet of two small ponds. The total area of the two ponds was slightly more than half the area of the new lake. As a result about one-half of Findley Lake is less than 10 feet deep. Within recent years this shallow area has become quite completely choked with vegetation. During the summer this vegetation becomes so dense that only the tops are alive. In the lower levels where sufficient light fails to penetrate, the vegetation is dead or dying. While green plants normally aerate the water, here so little of the plant actually is green that stagnant conditions prevail on the bottom. It is not unusual for algal and rooted aquatic plant growths to become sufficiently unpleasant although these growths seldom become sufficiently abundant to affect fish life adversely. The conditions in Findley Lake, however, leads one to conclude that vegetation may become so abundant as to be detrimental to fishing and fish production....

Bottom samples of water taken among the vegetation at a depth of 8 feet had only 0.4 parts per million of oxygen. In contrast to this in deeper water where vegetation is lacking and where surface winds can mix the water more completely, at a depth of 14 feet there were 3.96 parts per million of oxygen at one station. At this same station below the plane of the 14-foot contour or in that areas not greatly affected by surface winds, the oxygen dropped from 0.84 parts per million at 15 feet to 0.0 parts per million on the bottom at 31 feet. From this it can be seen that among the vegetation the oxygen is less at 8 feet than at almost twice the depth where the oxygen is lacking. The bottom chemical conditions were inadequate for fish needs. A probably contributing factor is the nature of the bottom. Most of the area flooded when the dam was built was low, muck land that in earlier times had probably been covered by natural ponds.

To remedy the condition here will not be easy. Weed elimination by chemical methods is out of the question for the present since so far as is known, chemicals sufficiently strong to eliminate rooted vegetation on a large scale would kill all fish life. Algal blooms in water supply reservoirs are controlled by chemical means but here it probably could not be done without some harmful effect to fish life. Mechanical methods are the only safe means of removing rooted aquatic plants, laborious as the task may be. Wood saws or rakes may be used for the purpose but it should be pointed out that the weeds should be completely removed after they are cut for two reasons: (1) if left in the water to decompose and use up oxygen, the main purpose of their destruction would be defeated and (2) since many aquatic plants reproduce asexually, more cutting is not sufficient to stop their growth or to prevent them from spreading into other suitable areas. The process would have to be repeated as often as necessary"

There are no Findley Lake tributary sites monitored through the NYSDEC Rotating Intensive Basins (RIBS) program. The major tributary to the lake is the West Branch of French Creek, which has not been sampled through any statewide monitoring programs.

Fisheries monitoring was also conducted in at least 1988 and 1989 in support of the state stocking program. Water clarity readings were within the range found through CSLAP, but the conductivity readings in CSLAP were higher than those measured through the fisheries monitoring program.

Lake Association and Management History

Findley Lake is served by the Findley Lake Watershed Foundation. The lake association is involved in a variety of lake management activities, including:

- Water level control
- shoreline stabilization of the Nature Center's small island
- ownership and operation of the weed harvester
- depositing navigation buoys in the lake
- overseeing the lake fishery

The Findley Lake Watershed Foundation maintains a website at http://www.flwf.org/. A TMDL (Total Maximum Daily Load calculation) was developed for the lake in 2008 to identify sources of nutrients that lead to water quality problems and use impairments (http://www.dec.ny.gov/docs/water_pdf/tmdlfindley08.pdf).

Summary of 2015 CSLAP Sampling Results

Evaluation of 2015 Annual and Monthly Results Relative to 2006-2013

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 – Findley Lake" section in Appendix C.

Evaluation of Eutrophication Indicators

Water quality conditions in 2015 in Findley Lake were probably close to normal. Phosphorus readings were much higher than usual, but while algae levels were higher than in many recent years, and some significant shoreline blooms were reported by the county Department of Health, overall algae levels were lower than in many previous sampling seasons. Water clarity was close to the long-term average for the lake, though lower in recent years. These readings have generally increased over the last thirty years.

Lake productivity typically increases during the summer, as manifested in increasing nutrient and algae levels, resulting in decreasing water clarity. These seasonal trends were also apparent in 2015, although phosphorus readings were variable during the summer.

The lake can be characterized as *eutrophic*, or highly productive, based on total phosphorus, water clarity, and chlorophyll *a* readings (all typical of *eutrophic* lakes). The trophic state indices (TSI) evaluation suggests that higher than expected water clarity readings sometimes occur, suggesting that algae growth may be patchy. Overall trophic conditions are summarized on the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Potable Water Indicators

The limited data indicated that algae levels are high enough to render the lake susceptible to taste and odor compounds, algal toxins, or elevated DBP (disinfection by product) compounds that could affect the potability of the water, although the lake is not classified for use as a drinking water supply. Hypolimnetic phosphorus is higher and ammonia readings are substantially higher than those measured at the lake surface. This suggests that deepwater intakes would be compromised for any "unofficial" potable water use. Deepwater phosphorus and ammonia levels were lower than normal in 2015. Potable water conditions, at least as measurable through CSLAP, are summarized in the Lake Scorecard and Lake Condition Summary Table.

Evaluation of Limnological Indicators

Ammonia and total nitrogen levels were higher than usual in 2015, and both have increased slightly since the early 2000s. Conductivity readings were also higher than usual in 2015, but they have not exhibited any clear long-term trends. Color readings have been higher since the lab change in 2002, but they were lower in 2015 than in most recent years.

Chloride levels in the 2015 samples, conducted for the first time through CSLAP and cited in Appendix A, were about 35 mg/l. These values are within the range of "moderate road salt" runoff levels cited by the New Hampshire DES, well below the state potable water quality standard of 250 mg/l but within the 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 found low to moderate total and blue green algae levels in the open water. However, shoreline blooms were reported by the county Department of Health in 2015, ranging from small to widespread. These were found in multiple locations, but particularly along the north and west shorelines, and nearly all samples were dominated by blue green algae (*Anabaena, Microcystis, Aphanizomenon, Planktothrix, and Woronichina*- all cyanobacteria species capable of producing toxins).

Macrophyte surveys conducted through CSLAP identified at least 16 aquatic plant species, and at least two exotic plant species (*Myriophyllum spicatum*, Eurasian watermilfoil, and *Potamogeton crispus,* curly-leafed pondweed) have been found in the lake. The modified floristic quality index (FQI) data indicate that the quality of the aquatic plant community is "fair."

The composition of the fish community includes a mix of coolwater (at least four species) and warmwater (at least five species) fish species. The lake fishery can likely be described as coolwater.

Zooplankton and macroinvertebrate surveys have not been conducted through CSLAP at Findley Lake.

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 slightly more favorable than normal in 2015, despite the frequent shoreline blue green algae blooms. Aquatic plant coverage was also lower than usual in 2015; it is not known if this was in response to active management. Water quality and recreational assessments (and to a lesser extent aquatic plant coverage) have improved since the late 1990s.

Lake recreational and water quality assessments degrade during the typical summer, despite the lack of significant seasonal change in aquatic plant coverage, but consistent with the seasonal increase in lake productivity. This trend was generally apparent in 2015, although plant coverage did decrease slightly during the summer. 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 were higher than normal in 2015, and these readings have increased slightly in recent years. It is not known if this is an indication of the lack of local climate change or if these changes cannot 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 periodically exceed the threshold for harmful algal blooms (HABs) in the open water, and persistently exceed this threshold along the shoreline, particularly along the north and west shoreline. Microcystin readings well above the levels needed to support safe swimming within shoreline blooms, although open water microcystin readings are usually below this threshold. Anatoxin-a levels were elevated in some samples, indicating a threat to pets recreating in the water. Lake residents and pets should avoid exposure to any shoreline blooms, and pets should be washed with clean water if exposed to blooms.

Lake Condition Summary

Category	Indicator	Min	Annual Avg	Max	2015 Avg	Classification	2015 Change?	Long-term Change?
Eutrophication Indicators	Water Clarity	0.33	1.71	5.35	1.55	Eutrophic	Within Normal Range	Increasing Slightly
	Chlorophyll *a*	0.20	30.13	274	21.78	Eutrophic	Within Normal Range	No Change
	Total Phosphorus	0.005	0.037	0.089	0.067	Eutrophic	Higher than Normal	No Change
Potable Water Indicators	Hypolimnetic Ammonia	0.00	0.49	1.91	0.17	Elevated Deepwater NH4	Lower Than Normal	Not known
	Hypolimnetic Arsenic							
	Hypolimnetic Iron							
	Hypolimnetic Manganese							
Limnological Indicators	Hypolimnetic Phosphorus	0.003	0.163	0.960	0.079	Close to Surface TP Readings	Lower Than Normal	Not known
	Nitrate + Nitrite	0.00	0.03	0.38	0.04	Low NOx	Within Normal Range	No Change
	Ammonia	0.00	0.04	0.31	0.09	Low Ammonia	Higher than Normal	No Change
	Total Nitrogen	0.16	0.61	1.49	0.80	Intermediate Total Nitrogen	Within Normal Range	No Change
	pH	6.80	7.97	9.05	7.75	Alkaline	Within Normal Range	No Change
	Specific Conductance	124	209	270	240	Intermediate Hardness	Higher than Normal	No Change
	True Color	2	16	222	14	Intermediate Color	Within Normal Range	Increasing Slightly
	Calcium	19.4	26.0	33.2	24.3	Highly Susceptible to Zebra Mussels	Within Normal Range	No Change
Lake Perception	WQ Assessment	0	2.6	5	2.3	Definite Algal Greenness	Within Normal Range	Slightly Improving
	Aquatic Plant Coverage	0	2.4	4	1.8	Subsurface Plant Growth	More Favorable Than Normal	No Change
	Recreational Assessment	0	2.9	4	2.2	Slightly Impaired	More Favorable Than Normal	Slightly Improving
Biological Condition	Phytoplankton					Open water-moderate blue algae biomass; Shoreline-high blue green algae in bloom	Not known	Not known
	Macrophytes					Fair quality of the aquatic plant community	Not known	Not known
	Zooplankton					Not evaluated through CSLAP	Not known	Not known
	Macroinvertebrates					Not evaluated through CSLAP	Not known	Not known
	Fish					Coolwater fishery	Not known	Not known
	Invasive Species					Eurasian watermilfoil, curly leafed pondweed	Not known	Not known
Local Climate Change	Air Temperature	9	22.9	36	25.0		Within Normal Range	No Change
	Water Temperature	12	22.9	30	25.5		Higher Than Normal	No Change
Harmful Algal Blooms	Open Water Phycocyanin	0	205	1291	17	Most readings indicate high risk of BGA	Not known	Not known
	Open Water FP Chl.a	0	9	38	2	Few readings indicate high algae levels	Not known	Not known
	Open Water FP BG Chl.a	0	7	37	2	Few readings indicate high BGA levels	Not known	Not known
	Open Water Microcystis	<DL	0.3	1.2	<DL	Mostly undetectable open water MC-LR	Not known	Not known
	Open Water Anatoxin a	<DL	0.5	8.2	<DL	Open water Anatoxin-a at times detectable	Not known	Not known
	Shoreline Phycocyanin	470	3.E+05	2.E+06		All readings indicate high risk of BGA	Not known	Not known
	Screening FP Chl.a	3	2847	24295	1047	Most readings indicate high algae levels	Not known	Not known
	Screening FP BG Chl.a	2	2844	24295	1044	Most readings indicate high BGA levels	Not known	Not known
	Shoreline Microcystis	<DL	23.1	214.8	0.1	Occasionally very high shoreline bloom MC-LR	Not known	Not known
	Shoreline Anatoxin a	<DL	<DL	0.3	<DL	Shoreline bloom Anatoxin-a at times detectable	Not known	Not known

Evaluation of Lake Condition Impacts to Lake Uses

Findley Lake is presently among the lakes listed on the 2007 Allegany River drainage basin Priority Waterbody List (PWL), with public bathing and recreation listed as *impaired* due to excessive nutrients, algae and weeds, and reduced water clarity. Aquatic life was listed as *stressed* due to hypolimnetic dissolved oxygen depletion. The PWL listing for Findley Lake is listed in Appendix B.

Potable Water (Drinking Water)

The CSLAP dataset at Findley Lake, 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. Algae (and algae toxin) levels may be high enough in the surface waters, and ammonia may be high enough in bottom waters to impact any "unofficial" use of the lake for potable water.

Public Bathing

The CSLAP dataset at Findley Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggests that public bathing may be *impaired* by poor water clarity, and shoreline harmful algal blooms, 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 Findley Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that recreation is *impaired* by excessive algae and shoreline blue green algae blooms.

Aquatic Life

The CSLAP dataset on Findley Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aquatic life may be *threatened* by hypolimnetic oxygen depletion, elevated pH, and road salt runoff, although additional data are needed to evaluate the food and habitat conditions for aquatic organisms in the lake.

Aesthetics and Habitat

The CSLAP dataset on Findley Lake, including water chemistry data, physical measurements, and volunteer samplers' perception data, suggest that aesthetics may be *poor* due to excessive algae, shoreline algae blooms and by frequent reports that the lake "looks bad.". Habitat may be only *fair* due to excessive growth of invasive weeds, particularly Eurasian watermilfoil.

Fish Consumption

There are no fish consumption advisories posted for Findley Lake.

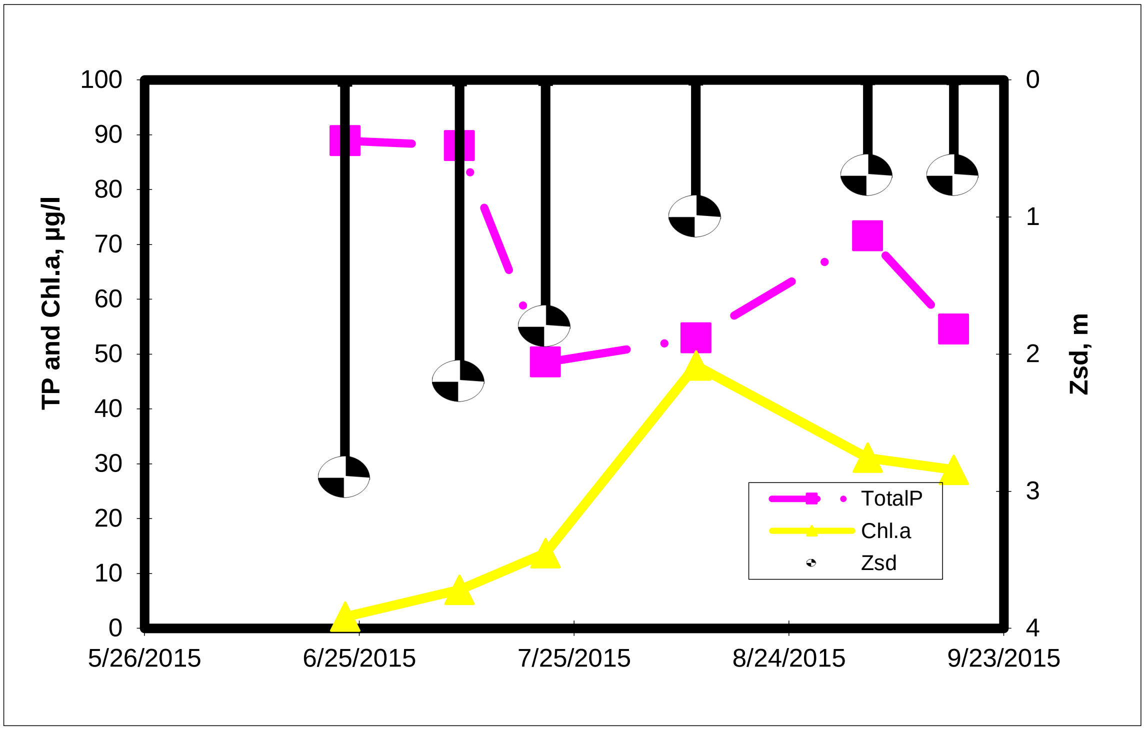
Additional Comments and Recommendations

Findley Lake should continue to be evaluated for shoreline algae blooms and the impacts from invasive species. The lake may be at risk for zebra mussels from nearby lakes. Additional plant surveys should be conducted to see if water chestnut, recently found nearby, has entered the lake.

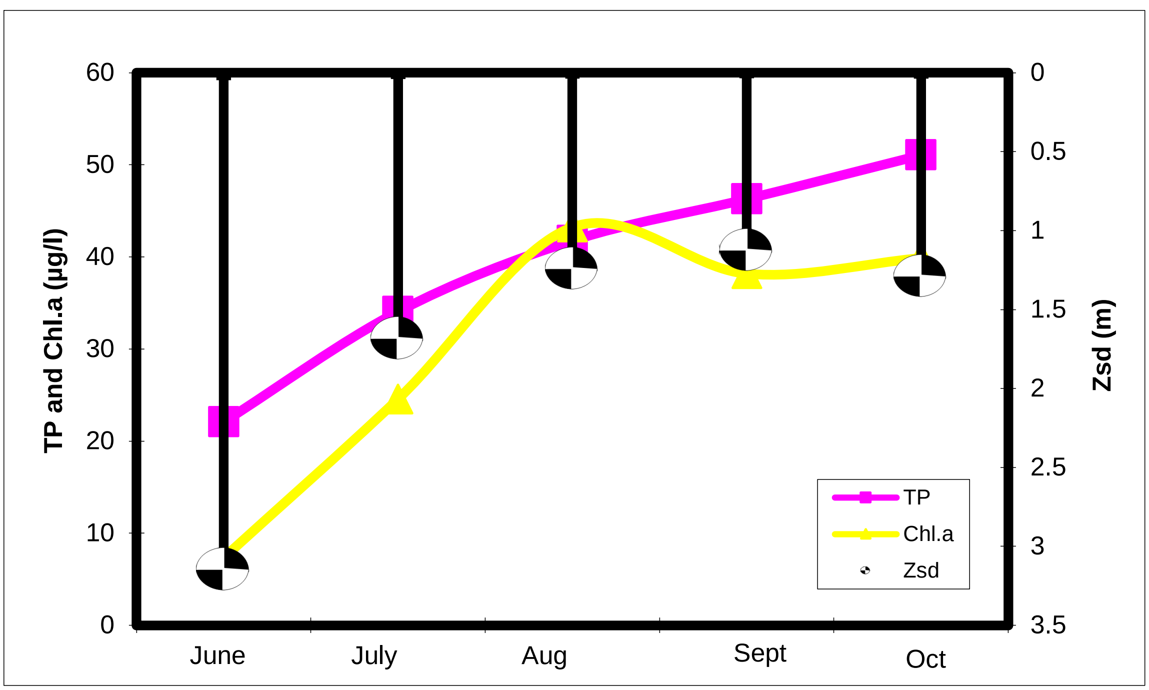
Aquatic Plant IDs-2015

None submitted for identification in 2015.

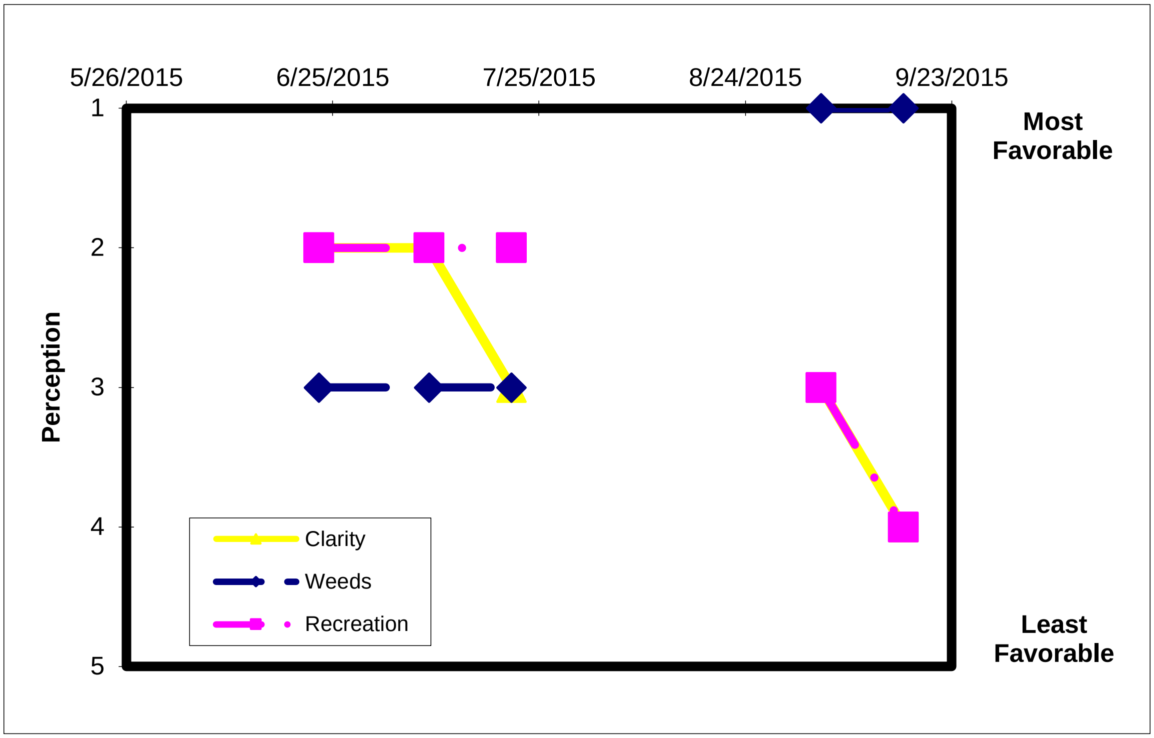
Time Series: Trophic Indicators, 2015



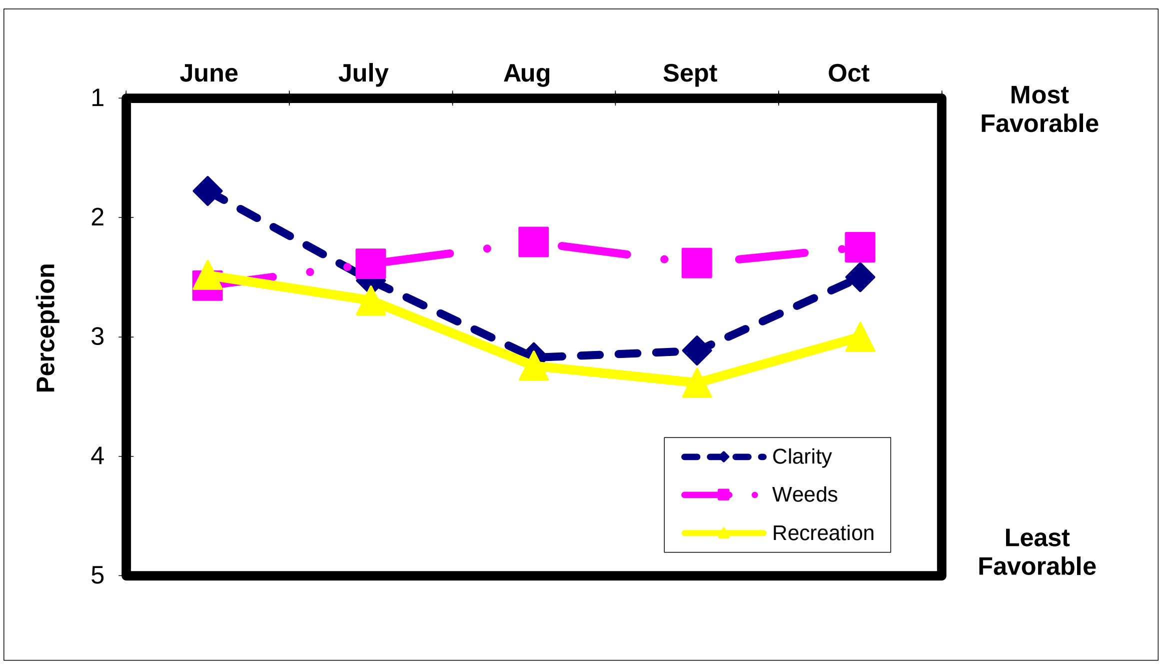
Time Series: Trophic Indicators, Typical Year (1986-2015)



Time Series: Lake Perception Indicators, 2015



Time Series: Lake Perception Indicators, Typical Year (1986-2015)



Appendix A- CSLAP Water Quality Sampling Results for Findley Lake

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca				Chl.a	Cl
24	Findley L	6/15/1986	11.5	3.00	1.5	0.026	0.12				5	6.92	190					2.22	
24	Findley L	6/21/1986	11.5	3.13	1.5	0.013	0.11				5	7.50	180					2.29	
24	Findley L	6/29/1986	11.5	2.25	1.5	0.011	0.09				10	7.62	185					2.00	
24	Findley L	7/3/1986	11.5	2.75	1.5	0.022	0.11				15	7.82	194					0.80	
24	Findley L	7/11/1986	11.5	2.00	1.5	0.021	0.03				2	7.84	185					5.03	
24	Findley L	7/18/1986	11.5	1.50	1.5	0.030	0.06				5	8.38	194						
24	Findley L	7/24/1986	11.5	2.63															
24	Findley L	8/1/1986	11.5	1.63	1.5	0.028	0.03				14	8.05	197						
24	Findley L	8/5/1986	11.5	1.13	1.5	0.018	0.03				11	7.75	191					53.30	
24	Findley L	8/12/1986			1.5	0.023	0.03				13	8.15	199					15.30	
24	Findley L	8/16/1986	11.5	0.75	1.5	0.035	0.03				12	8.98	195					36.30	
24	Findley L	8/21/1986	11.5	0.63	1.5	0.037	0.03				15	8.12	198					40.00	
24	Findley L	8/30/1986	11.5	1.00	1.5	0.034	0.03				3	7.60	205					29.60	
24	Findley L	9/5/1986	11.5	0.75	1.5	0.033	0.03				3	8.17	206					25.90	
24	Findley L	9/14/1986	11.5	0.63	1.5	0.036	0.03				13	7.55	215					22.20	
24	Findley L	9/21/1986	11.5	0.75	1.5	0.039	0.03				8	7.29	214					34.00	
24	Findley L	6/8/1987	11.5	2.75	1.5	0.023	0.03				15	8.10	201						
24	Findley L	6/14/1987	11.5	3.00	1.5	0.018					12	8.22	198						
24	Findley L	6/21/1987	11.5	2.00	1.5	0.023	0.01				15	7.83	203					17.00	
24	Findley L	6/28/1987	11.8	1.25	1.5	0.021	0.01				15	7.76	202					37.70	
24	Findley L	7/5/1987	11.8	0.75	1.5	0.032	0.01				11	7.70	206						
24	Findley L	7/12/1987	11.5	0.63	1.5	0.033					11	7.86	206					116.00	
24	Findley L	7/19/1987	11.5	0.75	1.5	0.040	0.01				15	7.49	206					109.00	
24	Findley L	7/26/1987	11.5	1.00	1.5	0.052					13	7.63	209					45.10	
24	Findley L	7/30/1987	11.5	0.75	1.5	0.056					12	7.38	210					73.30	
24	Findley L	8/9/1987	11.5	0.75	1.5	0.042	0.01				7	7.33	208					116.00	
24	Findley L	8/16/1987	11.5	0.50	1.5	0.060					6	7.14	216					274.00	
24	Findley L	8/23/1987	11.5	0.75	1.5	0.054	0.01				10	7.42	208						
24	Findley L	8/30/1987	11.5	0.75	1.5	0.052					12	7.46	204					73.00	
24	Findley L	9/6/1987	11.5	0.75	1.5	0.059	0.17				8	7.36	221					99.00	
24	Findley L	10/1/1987	11.5	0.75	1.5	0.049	0.03				11	7.30	215					73.20	
24	Findley L	6/21/1988	12.0	2.25	1.5	0.022	0.01				8	7.72	213					17.50	
24	Findley L	6/28/1988	11.5	1.75	1.5	0.022	0.01				7	7.77	219					10.10	
24	Findley L	7/5/1988	11.5	1.50	1.5	0.020	0.01				9	8.10	220					10.40	
24	Findley L	7/12/1988	11.0	1.00	1.5	0.023	0.01				11	8.19	234						
24	Findley L	7/19/1988	11.5	1.00	1.5	0.025	0.01				7	8.31	223					20.70	
24	Findley L	7/26/1988	12.0	1.50	1.5	0.029	0.01				10	7.71	221					1.78	
24	Findley L	7/31/1988	11.5	1.25	1.5	0.031	0.01				10	8.10	223					17.80	
24	Findley L	8/8/1988	11.5	1.00	1.5	0.037	0.01				11	7.97	219					31.10	
24	Findley L	8/12/1988	11.5	0.75	1.5	0.042	0.01				10	7.96	221					52.50	
24	Findley L	8/21/1988	11.8	0.75	1.5	0.042	0.01				6	8.32	227					49.60	
24	Findley L	8/30/1988	11.5	2.25	1.5	0.032	0.02				11	7.97	227					10.10	
24	Findley L	9/6/1988	11.3	1.75	1.5	0.037	0.03				14	7.86	227					18.50	
24	Findley L	9/12/1988	11.5	1.50	1.5	0.035	0.03				12	7.95	229					24.40	
24	Findley L	9/19/1988	11.8	1.00	1.5	0.040	0.01				8	8.09	230					38.50	
24	Findley L	9/25/1988	11.8	1.00	1.5	0.039	0.01				6	8.27	227					30.30	
24	Findley L	6/26/1989	11.0	3.25	1.5	0.017	0.14				7	7.94	198					2.16	
24	Findley L	7/2/1989	11.0	2.25	1.5	0.015					12	7.98	199					18.50	
24	Findley L	7/9/1989	11.0	2.25	1.5	0.022					15	7.76	204					6.45	
24	Findley L	7/16/1989	11.5	2.50	1.5	0.020					11	7.85	210					6.18	
24	Findley L	7/27/1989	11.5	2.50	1.5	0.025					10	8.13	200					9.77	
24	Findley L	7/31/1989	11.0	2.00	1.5	0.026					8	7.82	210					6.36	
24	Findley L	8/7/1989	10.5	2.50	1.5	0.029	0.06				8	8.18	214					7.19	
24	Findley L	8/14/1989	11.3	2.00	1.5	0.020					7	7.98	211					6.45	
24	Findley L	8/20/1989	11.5	2.00	1.5	0.024					2	8.24	212					6.65	
24	Findley L	8/29/1989	11.5	2.25	1.5	0.028					2	8.24	208					11.30	
24	Findley L	9/11/1989	11.0	1.75	1.5	0.025	0.01				5	8.16	211					17.80	
24	Findley L	9/25/1989	11.5	1.00	1.5	0.029					6	8.18	203					19.60	
24	Findley L	10/11/1989	11.0	1.25	1.5	0.038					5	8.16	210					18.50	
24	Findley L	7/10/1990	11.5	1.25	1.5	0.046	0.01					7.95							
24	Findley L	7/17/1990	11.3	1.25	1.5	0.037	0.01				13	7.72	209					36.60	
24	Findley L	7/31/1990	11.5	0.75	1.5	0.048	0.01				10	7.40	199					57.40	
24	Findley L	8/14/1990	11.5	0.81	1.5	0.044					10	7.24	199					45.10	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca				Chl.a	Cl
24	Findley L	8/28/1990	11.5	0.75	1.5	0.053	0.01				10	7.50	206					58.60	
24	Findley L	9/11/1990	11.0	0.75	1.5	0.051	0.01				12	8.11	205					62.70	
24	Findley L	9/25/1990	11.0	1.50	1.5	0.048	0.02				17	7.78	222					26.90	
24	Findley L	10/10/1990	11.0	2.50	1.5	0.062						8.23	205					9.40	
24	Findley L	7/22/1991	11.3	1.00	1.5	0.049	0.01				10	8.22	215					30.90	
24	Findley L	8/5/1991	13.0	0.75	1.5	0.055	0.01				14	7.63	220					82.80	
24	Findley L	8/19/1991	11.0	0.75	1.5	0.054	0.01				11	8.28	224					68.80	
24	Findley L	9/4/1991	11.7	0.33	1.5	0.079	0.01				9	7.59	219					149.00	
24	Findley L	9/18/1991	11.0	0.67	1.5	0.065						7.90	221					132.00	
24	Findley L	10/1/1991	11.5	0.58	1.5	0.064					7	7.81	220					126.00	
24	Findley L	6/29/1992	11.5	2.00	1.5	0.023					6	7.81	237					9.18	
24	Findley L	7/18/1992	11.5	1.50	1.5	0.013					6	8.05	232					15.40	
24	Findley L	8/11/1992	11.3	1.33	1.5	0.025					8	8.34	223					11.60	
24	Findley L	8/31/1992	11.5	1.75	1.5	0.035					9	8.23	228					10.20	
24	Findley L	9/28/1992	11.5	1.75	1.5	0.024					8	8.24	218					15.80	
24	Findley L	10/10/1992	11.6	1.50	1.5	0.034					11	8.06	225					28.50	
24	Findley L	7/6/1993	11.5	1.50	1.5	0.030					7	8.20	210					21.70	
24	Findley L	7/20/1993	11.5	1.50	1.5	0.043					2	7.75	210					15.50	
24	Findley L	8/9/1993	11.0	1.00	1.5	0.049					7	8.15	211					49.30	
24	Findley L	8/30/1993	11.3	0.75	1.5	0.063					7	8.16	202					45.90	
24	Findley L	9/21/1993	11.5	1.25	1.5	0.044					6	8.26	214					33.20	
24	Findley L	10/4/1993	11.5	1.29	1.5	0.048					5	8.07	216					18.90	
24	Findley L	6/14/1994	11.3	3.63	1.5	0.015	0.12				6	8.60	222					3.73	
24	Findley L	7/5/1994	11.5	2.00	1.5	0.023					7	7.90	221					10.20	
24	Findley L	7/25/1994	11.5	1.50	1.5	0.031					4	8.04	224					21.50	
24	Findley L	8/15/1994	11.8	1.25	1.5	0.039	0.03				11	7.96	206					32.70	
24	Findley L	9/5/1994	11.5	1.00	1.5	0.048					10	7.70	206					39.40	
24	Findley L	9/26/1994	13.0	0.80	1.5	0.059					12	7.83	208					50.30	
24	Findley L	6/5/1995	11.0	2.00	1.5	0.020					6							9.86	
24	Findley L	6/20/1995	11.0	1.00	1.5	0.028					7	8.16	230					24.40	
24	Findley L	7/10/1995	11.3	0.77	1.5	0.037						7.76	235					51.30	
24	Findley L	7/17/1995	11.4	0.75	1.5	0.053	0.01				5	8.07	237					53.80	
24	Findley L	7/31/1995	11.0	0.55	1.5	0.059					10	8.07	231					86.70	
24	Findley L	8/14/1995	11.5	0.33	1.5	0.082					5	7.48	232					172.00	
24	Findley L	6/17/1996	11.3	4.75	1.5	0.013	0.05				5	8.18	225					3.50	
24	Findley L	7/12/1996	11.5	1.65	1.5	0.023	0.08				10	7.84	218					20.50	
24	Findley L	7/17/1996	11.0	3.25	1.5	0.015	0.07				20	7.85	220					8.20	
24	Findley L	7/29/1996	11.0	3.25	1.5	0.018	0.04				10	8.03	218					5.90	
24	Findley L	8/12/1996	11.0	2.75	1.5	0.023	0.01				20	7.93	217					7.70	
24	Findley L	8/26/1996	11.0	3.75	1.5	0.018	0.01				5	8.43	214					5.20	
24	Findley L	9/9/1996	11.0	2.25	1.5	0.024	0.01				10	7.95	212					14.10	
24	Findley L	9/23/1996	11.5	2.28	1.5	0.056	0.01				10	7.96	210					19.10	
24	Findley L	6/9/1997	11.0	4.25	1.5	0.013	0.10				10	7.52	190					2.60	
24	Findley L	6/23/1997	11.0	5.13	1.5	0.015	0.08				10	8.07	186					3.08	
24	Findley L	7/7/1997	11.3	1.50	1.5	0.031	0.01				10	7.56	200					18.50	
24	Findley L	7/21/1997	11.8	1.28	1.5	0.030	0.01				10	7.83	202					19.70	
24	Findley L	8/4/1997	11.0	1.42	1.5	0.029	0.01				10	7.39	207					27.80	
24	Findley L	8/18/1997	11.5	1.71	1.5	0.032	0.01				7	7.56	206					20.20	
24	Findley L	9/1/1997	11.7	1.40	1.5	0.032	0.01				7	8.48	202					21.90	
24	Findley L	9/15/1997	11.3	1.75	1.5	0.025	0.01				9	8.41	200					13.90	
24	Findley L	6/8/1998	12.0	2.42	1.5	0.025	0.01				5	8.41	178					9.34	
24	Findley L	6/22/1998	11.5	3.13	1.5	0.020	0.01				3	7.51	185					6.32	
24	Findley L	7/7/1998	11.5	1.38	1.5	0.038	0.01				2	8.53	186					22.10	
24	Findley L	7/20/1998	11.5	0.78	1.5	0.044	0.14				5	8.61	173					40.50	
24	Findley L	8/3/1998	11.5	0.83	1.5	0.053	0.01				5	8.13	181					51.60	
24	Findley L	8/17/1998	11.8	0.83	1.5	0.070					14	9.05	183					57.10	
24	Findley L	8/31/1998	11.5	0.94	1.5	0.067					12	8.96	184					47.20	
24	Findley L	9/14/1998	10.8	0.80	1.5	0.067					6	7.80	194					43.20	
24	Findley L	6/7/1999	11.5	1.05	1.5	0.031	0.01				8	7.47	211					19.20	
24	Findley L	6/21/1999	11.8	1.19	1.5	0.035	0.01				6	8.21	204					21.90	
24	Findley L	7/5/1999	11.3	0.78	1.5	0.061	0.02				10	7.54	196					63.50	
24	Findley L	7/19/1999	11.7	0.71	1.5	0.081	0.01				12	7.36	198					69.00	
24	Findley L	8/2/1999	11.0	0.50	1.5	0.069	0.01				11	8.33	202					53.50	
24	Findley L	8/16/1999	11.0	0.55	1.5	0.068	0.01				7	7.33	215					45.90	
24	Findley L	8/30/1999	11.0	0.85	1.5	0.050	0.01				10	7.85	221					43.80	
24	Findley L	9/12/1999	11.0	0.68	1.5	0.054	0.01				6	7.21	227					57.00	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca				Chl.a	Cl
24	Findley L	6/19/2000	11.3	2.95	1.5	0.020	0.01				8	8.18	218					4.54	
24	Findley L	7/10/2000	12.0	2.00	1.5	0.017	0.01				4	7.80	217					7.10	
24	Findley L	7/17/2000	11.8	1.85	1.5	0.017	0.01				6	8.36	214					7.85	
24	Findley L	7/31/2000	11.0	1.95	1.5	0.023	0.01				4	8.62	210					10.80	
24	Findley L	8/14/2000	11.5	1.22	1.5	0.028	0.01				6	7.38	208					22.20	
24	Findley L	8/28/2000	11.5	1.13	1.5	0.042	0.01				8	8.20	210					42.10	
24	Findley L	9/11/2000	11.0	1.09	1.5	0.038	0.01				9	8.04	215					28.20	
24	Findley L	9/25/2000	11.8	2.25	1.5	0.023	0.04				8	8.09	222					6.95	
24	Findley L	06/15/03	8.3	5.35		0.011	0.09	0.03	0.36	72.66	7	7.95	245	31.0				2.46	
24	Findley L	06/29/03	11.5	4.15		0.005	0.04	0.02	0.30	126.92	6	8.33	251					7.79	
24	Findley L	07/13/03	11.1	1.95		0.017	0.02	0.00	0.23	29.22	10	8.52	242					1.09	
24	Findley L	07/28/03	10.9	2.00		0.021	0.01	0.02	0.16	17.06	9	8.33	233					3.33	
24	Findley L	08/10/03	8.7	3.05		0.018	0.03	0.04	0.59	72.43	20	8.32	229	29.0				3.35	
24	Findley L	08/24/03	9.0	2.00		0.027	0.00	0.01	0.41	34.02	45	8.50	223					5.90	
24	Findley L	09/07/03	10.1	1.90		0.025	0.03	0.03			43	8.42	218					32.94	
24	Findley L	09/21/03	11.1	1.15		0.032	0.02	0.04	0.37	25.80	46	8.26	227					4.99	
24	Findley L	6/13/2004	13.0	3.00		0.017	0.05	0.01	0.27	35.32	20	7.01	241	23.8				0.61	
24	Findley L	6/27/2004	10.3	3.20		0.017	0.01	0.01	0.32	40.64	20	7.34	233					2.70	
24	Findley L	7/18/2004	11.0	1.70		0.029	0.25	0.02	1.36	103.10	10	8.20	211					29.20	
24	Findley L	8/15/2004		1.20	0.6	0.000	0.01	0.02	0.46		13	7.14	214					10.60	
24	Findley L	9/18/2005	5.2	0.98	0.6	0.050	0.01	0.02	0.24	10.69	13	7.47	188					20.9	
24	Findley L	10/2/2005	11.0	0.95	0.6	0.054	0.03	0.03	0.26	10.50	17	7.81	209					30.0	
24	Findley L	6/18/2006	10.0	4.00		0.014	0.05	0.02	0.38	59.33	21	7.99	215	22.1				2.07	
24	Findley L	7/17/2006	10.6	3.60		0.017	0.02	0.02	0.46	59.59	7	8.46	267					2.05	
24	Findley L	6/30/2007	11.5	2.85		0.030	0.01	0.03	0.39	29.06	25	8.85	177	19.4				6.51	
24	Findley L	7/15/2007	10.9	1.80		0.076	0.01	0.05	0.57	16.72	30	8.97						13.20	
24	Findley L	7/29/2007	11.3	1.25		0.059	0.06	0.04	0.87	32.83	28	8.98	203					42.30	
24	Findley L	8/11/2007	11.2	0.90		0.058	0.03	0.11	0.97	37.03		8.47	226					47.20	
24	Findley L	8/25/2007	11.5	0.60		0.056	0.00	0.02	0.99	39.40	96	8.67	183	22.5				3.72	
24	Findley L	9/8/2007	11.8	0.78		0.055	0.01	0.03	1.45	58.03	19	8.38	184					50.56	
24	Findley L	9/16/2007	11.3	0.88		0.049	0.01	0.16	0.84	37.62	15	7.94	214					35.40	
24	Findley L	9/30/2007	11.5	0.90		0.054	0.01	0.02	0.94	38.78	11	7.98	220					46.84	
24	Findley L	6/8/2008	11.3	4.10	1.5	0.020	0.05	0.04	0.39	44.20	7	8.11	225	27.7				2.72	
24	Findley L	6/16/2008	11.0	4.40	1.0	0.025	0.02	0.02	0.19	17.25	120	7.92	172					0.38	
24	Findley L	6/30/2008	11.1	3.00	1.0	0.016	0.09	0.04	0.25	33.72	41	8.42	201					2.16	
24	Findley L	7/14/2008	11.0	2.05	1.0	0.021	0.01	0.02	0.28	29.04	16	8.18	193					5.24	
24	Findley L	8/4/2008	11.7	1.30	1.0	0.031	0.00	0.05	0.47	32.84	22	8.47	213	23.8				23.62	
24	Findley L	8/11/2008	11.0	1.10	1.0	0.035	0.01	0.05	0.46	28.73	29	8.16	216					26.42	
24	Findley L	9/2/2008	11.1	0.65	1.0	0.054	0.00	0.06	1.04	42.78	49	8.47	166					66.24	
24	Findley L	9/23/2008	11.6	0.75	1.0	0.049	0.02	0.06	0.78	34.53	31	8.09	220					52.76	
24	Findley L	06/19/2009	11.6	4.30	1.5	0.016	0.00	0.02	0.30	41.00	22	8.07	196	28.4				5.42	
24	Findley L	07/03/2009	12.0	2.95		0.017	0.04	0.03	0.27	35.25	33	8.09	158					1.45	
24	Findley L	07/18/2009	10.8	2.70	1.0	0.024	0.01	0.04	0.31	28.55	34	7.60	161					1.43	
24	Findley L	07/31/2009	11.4	2.45	1.0	0.019	0.01	0.04	0.28	33.00	25	7.88	154					10.51	
24	Findley L	08/13/2009	11.7	2.35	1.5	0.019	0.03	0.02	0.32	36.93	39	7.92	166	30.3				5.70	
24	Findley L	08/30/2009	10.6	1.45	1.5	0.029	0.01	0.06	0.32	24.42	28	7.69	208					18.00	
24	Findley L	09/07/2009	11.7	1.15	1.5	0.030	0.38	0.05	0.48	35.19	37	7.93	166					23.80	
24	Findley L	09/07/2009	grab	HAB															
24	Findley L	09/18/2009	11.0	1.65	1.5	0.028	0.01	0.04	0.49	38.60	53	6.82	181					3.00	
24	Findley L	6/4/2010	11.6	4.95	1.0	0.018	0.01	0.03	0.34	41.69	28	8.19	222	29.9				0.20	
24	Findley L	6/17/2010	11.1	3.65	1.0	0.017	0.01	0.04	0.51	65.36	16	8.43	270					4.80	
24	Findley L	7/1/2010	10.8	2.65	1.0	0.020	0.01	0.02	0.35	38.50	16	8.38	218					5.20	
24	Findley L	7/25/2010	11.4	0.90	1.0	0.043	0.01	0.03	0.60	30.48	104	8.46	202					10.60	
24	Findley L	8/1/2010	11.5	0.85	1.0	0.044	0.01	0.03	0.88	43.50	49	8.97	211	33.2				35.30	
24	Findley L	8/1/2010	grab	HAB															
24	Findley L	8/4/2010	grab	HAB															
24	Findley L	8/4/2010	grab	HAB															
24	Findley L	8/8/2010	11.7	0.80	1.0	0.051	0.01	0.03			20	8.30	221					30.40	
24	Findley L	8/25/2010	grab	HAB															
24	Findley L	8/25/2010	grab	HAB															
24	Findley L	8/25/2010	grab	HAB															
24	Findley L	8/29/2010	11.6	0.63	1.0	0.069	0.02	0.04	1.16	36.97	222	8.29	251					67.40	
24	Findley L	9/23/2010	11.7	0.70	1.0	0.073	0.05	0.05	1.13	34.32	55	7.57	242					54.60	
24	Findley L	9/25/2010	grab	HAB															
24	Findley L	7/17/2011	11.4	3.85		0.016	0.01	0.01	0.30	39.98	17	8.43	204	29.9					
24	Findley L	7/31/2011		2.98		0.022	0.01	0.02	0.36	35.90	28	7.69	124					18.20	

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP	TColor	pH	Cond25	Ca				Chl.a	Cl
24	Findley L	9/25/2011				0.064	0.01	0.05	1.49	51.17	64	7.92	189					18.20	
24	Findley L	6/17/2012		4.43		0.022	0.01	0.04	0.49	49.81	28	8.52	161	21.3				6.40	
24	Findley L	6/20/2012	9.9	3.50	1.5	0.038	0.01	0.03	0.28	16.11	8	6.80	194					4.30	
24	Findley L	7/17/2012	10.5	0.80	1.5	0.041	0.01	0.03	0.98	52.76	46	8.83	155					36.20	
24	Findley L	7/22/2012	9.7	0.90	1.5	0.045	0.02	0.03	1.08	52.26	19	8.62	170					33.40	
24	Findley L	8/6/2012	9.5	0.60	1.5	0.065	0.02	0.01	1.24	42.20	12	8.44	140	20.8				74.90	
24	Findley L	8/22/2012	9.2	0.53	1.5	0.066	0.05	0.23	1.43	47.38	15	7.51	209					76.90	
24	Findley L	9/11/2012	9.5	0.68	1.5	0.068	0.01	0.04	0.63	20.54	7	7.30	185					51.10	
24	Findley L	10/12/2012	9.5	1.50	1.5	0.060	0.03	0.31	1.04	38.24	10	6.87	175					14.50	
24	Findley L	6/25/2013	11.4	3.73	1.5	0.026	0.04	0.04	0.42	34.85	14	7.72	179					5.00	
24	Findley L	6/23/2015	10.3	2.90	1.5	0.089	0.08	0.03	0.38	9.43	7	7.62	249	24.1				2.10	
24	Findley L	7/9/2015	10.5	2.20	1.5	0.088			0.69	17.28	12	7.45	234					7.00	
24	Findley L	7/21/2015	9.9	1.80	1.5	0.049	0.02	0.08	0.61	27.53	16	7.56	226					13.70	34.70
24	Findley L	8/11/2015	10.3	1.00	1.5	0.053			1.09	45.50	17	8.31	244					47.90	
24	Findley L	9/4/2015	11.0	0.70	1.5	0.072	0.01	0.16	1.26	38.62	22	8.05	243	24.4				31.10	
24	Findley L	8/11/2015			bloom														
24	Findley L	8/11/2015			bloom														
24	Findley L	8/19/2015			bloom														
24	Findley L	8/19/2015			bloom														
24	Findley L	8/23/2015			bloom														
24	Findley L	8/31/2015			bloom														
24	Findley L	9/8/2015			bloom														
24	Findley L	9/8/2015			bloom														
24	Findley L	9/15/2015			bloom														
24	Findley L	9/15/2015			bloom														
24	Findley L	9/15/2015			bloom														
24	Findley L	9/15/2015			bloom														
24	Findley L	9/24/2015			bloom														
24	Findley L	9/24/2015			bloom														
24	Findley L	10/6/2015			bloom														
24	Findley L	10/6/2015			bloom														
24	Findley L	9/16/2015	11.5	0.70	1.5	0.055			0.79	31.81	12	7.49	247					28.90	
LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP								NO2	
24	Findley L	6/22/1998			10.0	0.211													
24	Findley L	7/20/1998				0.465													
24	Findley L	8/17/1998				0.618													
24	Findley L	9/14/1998				0.960													
24	Findley L	06/15/03				0.012	0.11	0.08	0.28	23.33									
24	Findley L	06/29/03				0.008	0.02	0.02	0.31	37.80									
24	Findley L	07/13/03				0.017	0.04	0.06	0.36	21.19									
24	Findley L	07/28/03				0.018	0.00	0.00	0.05	2.50									
24	Findley L	08/10/03				0.003	0.06	0.03	0.63	186.11									
24	Findley L	08/24/03				0.017	0.00	0.01	0.43	25.40									
24	Findley L	09/07/03				0.025	0.03	0.01											
24	Findley L	09/21/03				0.028	0.01	0.01	0.37	13.42									
24	Findley L	6/13/2004				0.036	0.07	0.02	0.50	13.87									
24	Findley L	6/30/2007	11.5			0.140													
24	Findley L	7/15/2007	10.9			0.070													
24	Findley L	7/29/2007	11.3			0.154													
24	Findley L	8/11/2007	11.2			0.199													
24	Findley L	8/25/2007	11.5			0.192													
24	Findley L	9/8/2007	11.8			0.045													
24	Findley L	9/16/2007	11.3			0.242													
24	Findley L	9/30/2007	11.5			0.565													
24	Findley L	6/8/2008	11.3		10.0	0.029													
24	Findley L	6/16/2008	11.0		10.0	0.072													
24	Findley L	6/30/2008	11.1		10.0	0.019													
24	Findley L	7/14/2008	11.0		10.0	0.038													
24	Findley L	8/4/2008	11.7		10.0	0.106													
24	Findley L	8/11/2008	11.0		9.0	0.092													
24	Findley L	9/2/2008	11.1		10.1	0.477													
24	Findley L	9/23/2008	11.6		10.0	0.416													
24	Findley L	06/19/2009			10.0	0.038		0.40											
24	Findley L	07/03/2009				0.145		0.66											
24	Findley L	07/18/2009			9.5	0.009		0.51											

LNum	PName	Date	Zbot	Zsd	Zsamp	Tot.P	NO3	NH4	TDN	TN/TP								NO2	
24	Findley L	07/31/2009			10.0	0.180		0.72											
24	Findley L	08/13/2009			10.0	0.220		0.03											
24	Findley L	08/30/2009			9.5	0.276		1.41											
24	Findley L	09/07/2009			10.0	0.150		1.44											
24	Findley L	09/18/2009			10.0	0.366		1.09											
24	Findley L	6/4/2010	11.6		10.0	0.033		0.33											
24	Findley L	6/17/2010	11.1		10.0	0.037		0.34											
24	Findley L	7/1/2010	10.8		9.0	0.033		0.14											
24	Findley L	7/25/2010	11.4		10.0	0.247		0.78											
24	Findley L	8/1/2010	11.5		10.0	0.194		0.67											
24	Findley L	8/8/2010	11.7		10.0	0.244		0.57											
24	Findley L	8/29/2010	11.6		10.0	0.272		0.95											
24	Findley L	9/23/2010	11.7		10.0	0.190		1.39											
24	Findley L	7/17/2011	11.4		11.0	0.321		1.22										0.01	
24	Findley L	7/31/2011			11.3	0.095		1.04										0.01	
24	Findley L	9/25/2011				0.484		1.91										0.01	
24	Findley L	6/17/2012				0.068		0.37											
24	Findley L	6/26/2012			9.0	0.020		0.03										0.00	
24	Findley L	7/17/2012				0.020		0.14										0.00	
24	Findley L	7/22/2012			8.5	0.087		0.25										0.00	
24	Findley L	8/6/2012			8.5	0.141		0.42										0.00	
24	Findley L	8/23/2012			8.5	0.309		1.01										0.00	
24	Findley L	9/11/2012			9.0	0.256		0.09										0.00	
24	Findley L	10/12/2012			8.5	0.055		0.35										0.01	
24	Findley L	6/25/2013			9.5	0.006		0.66											
24	Findley L	6/23/2015				0.034		0.14											
24	Findley L	7/10/2015			8.5	0.076													
24	Findley L	7/21/2015				0.097		0.19											
24	Findley L	8/11/2015				0.123													
24	Findley L	9/4/2015				0.078		0.19											
24	Findley L	9/16/2015				0.065													

LNum	PName	Date	Site	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
24	Findley L	6/15/1986	epi	18	19															
24	Findley L	6/21/1986	epi	23	20															
24	Findley L	6/29/1986	epi	22	21															
24	Findley L	7/3/1986	epi	15	20															
24	Findley L	7/11/1986	epi	15	20															
24	Findley L	7/18/1986	epi	30	24															
24	Findley L	7/24/1986	epi	30	25															
24	Findley L	8/1/1986	epi	26	24															
24	Findley L	8/5/1986	epi	26	25															
24	Findley L	8/16/1986	epi	24	24															
24	Findley L	8/21/1986	epi	26	25															
24	Findley L	8/30/1986	epi	20	19															
24	Findley L	9/5/1986	epi	21	20															
24	Findley L	9/14/1986	epi	14	19															
24	Findley L	9/21/1986	epi	17	18															
24	Findley L	6/8/1987	epi	22	24															
24	Findley L	6/14/1987	epi	25	22															
24	Findley L	6/21/1987	epi	27	25															
24	Findley L	6/28/1987	epi	19	23															
24	Findley L	7/5/1987	epi	23	23															
24	Findley L	7/12/1987	epi	30	27															
24	Findley L	7/19/1987	epi	27	26															
24	Findley L	7/26/1987	epi	24	27															
24	Findley L	7/30/1987	epi	25	27															
24	Findley L	8/9/1987	epi	24	24															
24	Findley L	8/16/1987	epi	27	27															
24	Findley L	8/23/1987	epi	18	22															
24	Findley L	8/30/1987	epi	21	20															
24	Findley L	9/6/1987	epi	19	19															
24	Findley L	10/1/1987	epi	14	17															
24	Findley L	6/21/1988	epi	25	24															
24	Findley L	6/28/1988	epi	20	24															

LNum	PName	Date	Site	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
24	Findley L	7/5/1988	epi	29	25															
24	Findley L	7/12/1988	epi	28	27															
24	Findley L	7/19/1988	epi	26	28															
24	Findley L	7/26/1988	epi	26	25															
24	Findley L	7/31/1988	epi	24	26															
24	Findley L	8/8/1988	epi	27	28															
24	Findley L	8/12/1988	epi	26	27															
24	Findley L	8/21/1988	epi	20	25															
24	Findley L	8/30/1988	epi	18	23															
24	Findley L	9/6/1988	epi	15	20															
24	Findley L	9/12/1988	epi	24	20															
24	Findley L	9/19/1988	epi	24	20															
24	Findley L	9/25/1988	epi	24	18															
24	Findley L	6/26/1989	epi	29	27															
24	Findley L	7/2/1989	epi	22	23															
24	Findley L	7/9/1989	epi	27	25															
24	Findley L	7/16/1989	epi	25	24															
24	Findley L	7/27/1989	epi	27	25															
24	Findley L	7/31/1989	epi	21	24															
24	Findley L	8/7/1989	epi	17	23															
24	Findley L	8/14/1989	epi	24	22															
24	Findley L	8/20/1989	epi	20	23															
24	Findley L	8/29/1989	epi	26	24															
24	Findley L	9/11/1989	epi	21	22															
24	Findley L	9/25/1989	epi	14	16															
24	Findley L	10/11/1989	epi	11	12															
24	Findley L	7/10/1990	epi	22	23															
24	Findley L	7/17/1990	epi	25	23															
24	Findley L	7/31/1990	epi	21	24															
24	Findley L	8/14/1990	epi	22	23															
24	Findley L	8/28/1990	epi	23	23															
24	Findley L	9/11/1990	epi	21	22															
24	Findley L	9/25/1990	epi	14	15															
24	Findley L	10/10/1990	epi	21	16															
24	Findley L	7/22/1991	epi	26	27															
24	Findley L	8/5/1991	epi	24	23															
24	Findley L	8/19/1991	epi	23	24															
24	Findley L	9/4/1991	epi	20	22															
24	Findley L	9/18/1991	epi	20	22															
24	Findley L	10/1/1991	epi	19	17															
24	Findley L	6/29/1992	epi	22	21	3	2	3	1											
24	Findley L	7/18/1992	epi	22	23	3	2	3	14											
24	Findley L	8/11/1992	epi	23	24															
24	Findley L	8/31/1992	epi	17	20	3	2	2	15											
24	Findley L	9/28/1992	epi	20	18	2	2	2	5											
24	Findley L	10/10/1992	epi	14	15	2	3	3	5											
24	Findley L	7/6/1993	epi	26	25	3	2	2												
24	Findley L	7/20/1993	epi	21	24	3	2	3	5											
24	Findley L	8/9/1993	epi	24	23	3	2	3	1											
24	Findley L	8/30/1993	epi	27	26	3	3	4	123											
24	Findley L	9/21/1993	epi	15	18	2	4	4	25											
24	Findley L	10/4/1993	epi	17	14	3	3	4	125											
24	Findley L	6/14/1994	epi	31	23	2	2	2												
24	Findley L	7/5/1994	epi	27	24	2	2	3	56											
24	Findley L	7/25/1994	epi	23	25	3	2	3	14											
24	Findley L	8/15/1994	epi	21	21	3	2	4	135											
24	Findley L	9/5/1994	epi	19	20	4	2	3	134											
24	Findley L	9/26/1994	epi	19	19	3	3	4	135											
24	Findley L	6/5/1995	epi	25	22	2	2	2												
24	Findley L	6/20/1995	epi	30	27	3	2	4	14											
24	Findley L	7/10/1995	epi	23	23	3	3	3	15											
24	Findley L	7/17/1995	epi	28	27	3	2	3	14											
24	Findley L	7/31/1995	epi	30	28	3	3	3	134											
24	Findley L	8/14/1995	epi	31	27	4	2	3	134											
24	Findley L	6/17/1996	epi	24	22	1	2	1												

LNum	PName	Date	Site	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
24	Findley L	7/12/1996	epi	27	25	2	2	3	14											
24	Findley L	7/17/1996	epi	32	25	2	2	3												
24	Findley L	7/29/1996	epi	22	23	2	2	2	5											
24	Findley L	8/12/1996	epi	22	23	2	2	3	2											
24	Findley L	8/26/1996	epi	23	24															
24	Findley L	9/9/1996	epi	25	22	3	4	4	24											
24	Findley L	9/23/1996	epi	19	17	3	4	4	24											
24	Findley L	6/9/1997	epi	24	19	1	3	3	2											
24	Findley L	6/23/1997	epi	24	23	1	3	3	2											
24	Findley L	7/7/1997	epi	20	23	3	2	3	1											
24	Findley L	7/21/1997	epi	26	25	3	3	3	134											
24	Findley L	8/4/1997	epi	20	23	3	3	3	2334											
24	Findley L	8/18/1997	epi	19	22	3	3	4	124											
24	Findley L	9/1/1997	epi	26	22	3	3	4	124											
24	Findley L	9/15/1997	epi	24	21	3	3	4	12											
24	Findley L	6/8/1998	epi	17	18	2	4	4	2											
24	Findley L	6/22/1998	epi	25	24	2	4	4	24											
24	Findley L	7/7/1998	epi	26	25	3	4	4	124											
24	Findley L	7/20/1998	epi	29	26	3	4	4	1234											
24	Findley L	8/3/1998	epi	25	23	5	4	4	1234											
24	Findley L	8/17/1998	epi	30	25	4	3	4	124											
24	Findley L	8/31/1998	epi	24	23	4	4	4	1234											
24	Findley L	9/14/1998	epi	22	20	4	3	4	1234											
24	Findley L	6/7/1999	epi	35	25	3	3	3	234											
24	Findley L	6/21/1999	epi	20	22	3	3	3	24											
24	Findley L	7/5/1999	epi	33	24	3	3	4	124											
24	Findley L	7/19/1999	epi	27	26	3	3	3	1234											
24	Findley L	8/2/1999	epi	23	26	4	3	4	134											
24	Findley L	8/16/1999	epi	28	22	3	3	4	134											
24	Findley L	8/30/1999	epi	20	22	4	2	4	134											
24	Findley L	9/12/1999	epi	22	21	4	3	3	134											
24	Findley L	6/19/2000	epi	26	22	2	3	2	2											
24	Findley L	7/10/2000	epi	26		2	3	3	2											
24	Findley L	7/17/2000	epi	27	24	2	3	3	2											
24	Findley L	7/31/2000	epi	29	26	2	3	3	12											
24	Findley L	8/14/2000	epi	27	25	3	2	3	125											
24	Findley L	8/28/2000	epi	27	23	3	2	4	13											
24	Findley L	9/11/2000	epi	26	24	3	2	3	134											
24	Findley L	9/25/2000	epi	12	18	2	2	2	5											
24	Findley L	06/15/03	epi	27		2	2	2												
24	Findley L	06/29/03	epi	25	23	2	3	3	2											
24	Findley L	07/13/03	epi	36	24															
24	Findley L	07/28/03	epi	22	23															
24	Findley L	08/10/03	epi	26	25															
24	Findley L	08/24/03	epi	20	25															
24	Findley L	09/07/03	epi	20	22	3	3	4	25											
24	Findley L	09/21/03	epi	21	22	4	4	4	123											
24	Findley L	6/13/2004	epi	25	22	2	3	3	2											
24	Findley L	6/27/2004	epi	22	22	2	3	3	2											
24	Findley L	7/18/2004	epi	27	23	3	2	3	13											
24	Findley L	8/15/2004	epi	24	21	3	2	3	3											
24	Findley L	9/18/2005	epi	24	23	3	1	3	3											
24	Findley L	10/2/2005	epi	29	18	3	1	3	13											
24	Findley L	6/18/2006	epi	29	25		3		2											
24	Findley L	7/17/2006	epi	29		2	1	2	8											
24	Findley L	6/30/2007	epi	13	22	2	3	3	2											
24	Findley L	7/15/2007	epi	17	23	3	2	3	15											
24	Findley L	7/29/2007	epi	18	24	3	2	3	123											
24	Findley L	8/11/2007	epi	17	26	3	1	3	1238											
24	Findley L	8/25/2007	epi	22	27	4	1	4	1234											
24	Findley L	9/8/2007	epi	19	26	4	2	3	158											
24	Findley L	9/16/2007	epi	11	20	4	2	3	12358											
24	Findley L	9/30/2007	epi	9	18	3	1	3	1											
24	Findley L	6/8/2008	epi	23	20	1	1	1	8											
24	Findley L	6/16/2008	epi	22	21	1	2	2	5											

LNum	PName	Date	Site	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
24	Findley L	6/30/2008	epi	17	21	2	2	2	58											
24	Findley L	7/14/2008	epi	25	24	2	2	2	8											
24	Findley L	8/4/2008	epi	20	25	3	2	2	18											
24	Findley L	8/11/2008	epi	20	22	3	1	2	157											
24	Findley L	9/2/2008	epi	26	25	4	3	4	1378											
24	Findley L	9/23/2008	epi	19	18	3	2	3	18											
24	Findley L	06/19/2009	epi	25	23	1	2	2	0											
24	Findley L	07/03/2009	epi	21	21	2	2	2	0											
24	Findley L	07/18/2009	epi	20	22	2	1	2	8											
24	Findley L	07/31/2009	epi	23	24	2	2	3	56											
24	Findley L	08/13/2009	epi	26	24	2	2	3	68					0.45						
24	Findley L	08/30/2009	epi	19	21	3	2	3	5											
24	Findley L	09/07/2009	epi	22	22	2	2	3	1					0.99						
24	Findley L	09/07/2009	bloom											126.7						
24	Findley L	09/18/2009	epi	21	21	2	3	2	3	8		150.6								
24	Findley L	6/4/2010	epi	25	20	2	1	2	1	0	5									
24	Findley L	6/17/2010	epi	20	18	2	1	2	2	0	0									
24	Findley L	7/1/2010	epi	20	23	2	1	2	2	8	0									
24	Findley L	7/25/2010	epi	24	27	2	3	1	2	15	0									
24	Findley L	8/1/2010	epi	30	27	2	3	2	3	13	0	1291.		1.16						
24	Findley L	8/1/2010	bloom									480.0		0.73						
24	Findley L	8/4/2010	bloom									1076.		1.05						
24	Findley L	8/4/2010	bloom									7496.		9.84						
24	Findley L	8/8/2010	epi	22	24	2	3	2	3	18	0									
24	Findley L	8/25/2010	bloom									3940.		2.42						
24	Findley L	8/25/2010	bloom									470.0		9.19						
24	Findley L	8/25/2010	bloom									7870.		4.82						
24	Findley L	8/29/2010	epi	20	24	2	4	2	4	1	4									
24	Findley L	9/23/2010	epi	17	20	2	3	2	3	1	4	465.0		0.20						
24	Findley L	9/25/2010	bloom									2e06		11.10						
24	Findley L	7/17/2011	epi		27	2	2	3	1	0	0	11.70	1.80							
24	Findley L	7/31/2011	epi	29	27	2	2	3	1	0	0	52.30	5.10							
24	Findley L	9/25/2011	bloom									784.4	13.5							
24	Findley L	2011	bloom											0.22						
24	Findley L	2011	bloom											214.8						
24	Findley L	6/17/2012	epi	25	24	1	3	3	2	0	0	4.80	0.40	<0.30	<0.417		1.16	0.80	I	
24	Findley L	6/20/2012	epi	24	26	1	2	2	8	0	0	12.80	0.40	<0.30	<0.428		3.43	2.86	I	
24	Findley L	7/17/2012	epi	31	30	3	3	3	13	4	4	126.3	1.80	0.38	<0.392		22.20	18.90	B	
24	Findley L	7/22/2012	epi	19	26	3	2	3	1234	4	4	183.9	1.60	0.33	<0.292		15.06	13.65	BC	
24	Findley L	8/6/2012	epi	23	27	3	2	3	123	47	4	284.8	2.00	<0.30	3.55		38.25	37.03	F	
24	Findley L	8/13/2012	bloom											118.9	<1.074		13039	13039	ABCD	
24	Findley L	8/22/2012	epi	22	25	4	3	4	1234	4	4	137.2	1.90	0.57	8.23		16.69	5.42	B	
24	Findley L	8/23/2012	bloom											19.46	0.03		3.42	1.67		
24	Findley L	8/23/2012	bloom											19.45	0.04		24295	24295		
24	Findley L	9/11/2012	epi	20	24	2	1	4	134	4	4	602.6	1.80	<0.30	<3.299		8.35	8.35	B	
24	Findley L	10/12/2012	epi	10	15	2	2	2	0	0	4	73.70	0.70	0.48	<3.205		9.96	9.65	I	
24	Findley L	6/25/2013	epi	21	25	2	3	2	2	0	0	9.10	1.30	<0.30	<0.400		2.40	0.40	I	I
24	Findley L	7/9/2015	epi	24	22	2	3	2	5			3.20	0.20	<0.65	<0.007	<0.000	0.12	0.00	I	I
24	Findley L	7/21/2015	epi	27	25	2	3	2	0	4	4	26.80	0.40				5.23	4.10	I	I
24	Findley L	8/11/2015	epi	23	27	3	3	2	1	0	0	7.50	0.05	<0.30	<0.002	<0.014	0.58	0.21	A	A
24	Findley L	9/4/2015	epi	22	25	0	0	0				8.00	0.30	<0.65	<0.005	<0.015	1.34	0.84	I	I
24	Findley L	8/11/2015	epi											<0.26	0.03	<0.086	7.55	6.71	F	I
24	Findley L	8/11/2015	epi											<0.88	0.08	<0.025	46.83	45.12	F	F
24	Findley L	8/19/2015	epi											<0.88	<0.007	<0.025	61.74	58.21		c
24	Findley L	8/19/2015	epi											<0.95	0.02	<0.042	65.35	62.60		b
24	Findley L	8/23/2015	epi											<0.95	<0.017	<0.042	95.88	91.49		b
24	Findley L	8/31/2015	epi											<1.29	0.06	<0.031	812.0	812.00		b
24	Findley L	9/8/2015	epi											33.04	<0.048	<0.122	12513	12513.75		
24	Findley L	9/8/2015	epi											<0.54	0.14	<0.024	37.12	33.38		
24	Findley L	9/15/2015	epi											<0.79	0.26	<0.024	122.6	119.01		
24	Findley L	9/15/2015	epi											<0.78	<0.019	<0.044	1949.	1936.5		ab
24	Findley L	9/15/2015	epi											52.31	<0.019	<0.044	133.4	130.77		
24	Findley L	9/15/2015	epi											11.65	0.02	<0.044	28.02	24.50		
24	Findley L	9/24/2015	epi											7.58	<0.019	<0.044	547.5	547.50		
24	Findley L	9/24/2015	epi											<0.78	<0.036	<0.049	237.1	237.12		

LNum	PName	Date	Site	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
24	Findley L	10/6/2015	epi											<0.78	<0.036	<0.049	33.32	29.88		
24	Findley L	10/6/2015	epi											<2.36	<0.449	<0.027	36.55	34.28		
24	Findley L	9/16/2015	epi	30	29	3	1	3	13	4	4	58.70	0.40	<3.55	<0.674	<0.041	29.56	26.94		
24	Findley L	6/22/1998	hypo		14															
24	Findley L	7/20/1998	hypo		15															
24	Findley L	9/14/1998	hypo		12															
24	Findley L	6/4/2010	hypo		24															
24	Findley L	6/17/2010	hypo		22															
24	Findley L	7/1/2010	hypo		19															
24	Findley L	7/25/2010	hypo		20															
24	Findley L	8/1/2010	hypo		20															
24	Findley L	8/8/2010	hypo		20															
24	Findley L	8/29/2010	hypo		20															
24	Findley L	9/23/2010	hypo		17															
24	Findley L	6/26/2012	hypo		17															
24	Findley L	7/22/2012	hypo		14															
24	Findley L	8/6/2012	hypo		15															
24	Findley L	8/23/2012	hypo		14															
24	Findley L	9/11/2012	hypo		15															
24	Findley L	10/12/2012	hypo		14															
24	Findley L	6/25/2013	hypo		14															

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 = surface, hypo = 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)	0.3 ug/l	none
Cyl	Cylindrospermposin (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 Findley Lake

Findley Lake (0202-0004) — Impaired Seg

Waterbody Location Information — Revised: 02/26/2007

Water Index No:	Pa-84- 2-P153			**Drain Basin:**	Allegheny River
Hydro Unit Code:	05010004/010	**Str Class:**	B		French Creek
Waterbody Type:	Lake			**Reg/County:**	9/Chautauqua Co. (7)
Waterbody Size:	307.1 Acres			**Quad Map:**	CLYMER (M-02-4)
Seg Description:	entire lake				

Water Quality Problem/Issue Information (CAPS indicate MAJOR Use Impacts/Pollutants/Sources)

Use(s) Impacted	Severity	Problem Documentation
PUBLIC BATHING	Impaired	Known
Aquatic Life	Stressed	Known
RECREATION	Impaired	Known

Type of Pollutant(s)
Known: ALGAL/WEED GROWTH, D.O./OXYGEN DEMAND, NUTRIENTS (phosphorus)
Suspected: Problem Species
Possible: - - -

Source(s) of Pollutant(s)
Known: - - -
Suspected: AGRICULTURE, Habitat Modification
Possible: Failing On-Site Syst

Resolution/Management Information

Issue Resolvability: 1 (Needs Verification/Study (see STATUS))
Verification Status: 4 (Source Identified, Strategy Needed)
Lead Agency/Office: DOW/Reg9 — **Resolution Potential:** Medium
TMDL/303d Status: 3a->1 ( )

Further Details

Public Bathing and other recreational uses in Findley Lake are considered to be impaired by nutrient enrichment and excessive aquatic plant growth. Impacts to the fishery have also been noted. These impairments are attributed to agricultural and other nonpoint runoff sources.

Findley Lake has been sampled as part of the NYSDEC Citizen Statewide Lake Assessment Program (CSLAP) beginning in 1986 and continuing through 2005. The most recent Interpretive Summary report of the findings of this sampling was published in 2006. These data indicate that the lake continues to be best characterized as eutrophic, or highly productive. Samples collected as recently as 2002 thru 2004 suggest possible improving conditions toward the mesotrophic, or moderately productive, range. However phosphorus levels in the lake consistently exceed the state guidance values indicating impacted recreational uses. Transparency measurements regularly fall below what is minimally recommended for swimming beaches. Nutrient levels at the lake bottom are usually elevated suggesting the bottom waters are poorly oxygenated and contribute to increases in surface water nutrient levels throughout the summer. This deepwater oxygen deficit was recorded in the lake at least back to the 1930s. (DEC/DOW, BWAM/CSLAP, February 2006)

Public perception of the lake and its uses is also evaluated as part of the CSLAP program. These assessment also indicate recreational suitability of the lake to be somewhat unfavorable. The lake is described most frequently as "slightly" impacted for most recreational uses. The lake itself is most often described as having "definite algal greenness," an assessment that is consistent with the perceived water quality conditions in the lake and its measured water quality characteristics. Assessments have noted that aquatic plants regularly grow to the lake surface. Aquatic plants are dominated by a mix of native and non-native species (though invasives may be on the decline) and have been cited as impacting recreational uses. (DEC/DOW, BWAM/CSLAP, February 2006)

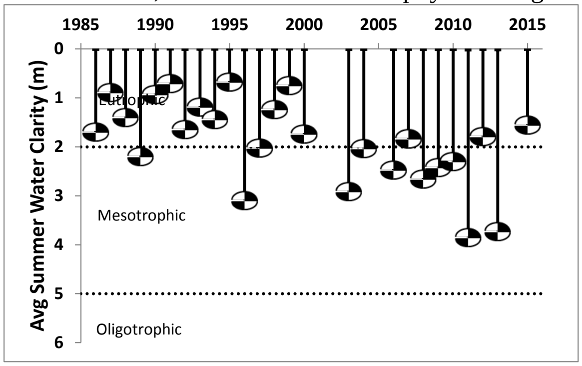
This lake waterbody is designated class B, suitable for use as a public bathing beach, general recreation and aquatic life support, but not as a water supply. Water quality monitoring by NYSDEC focuses primarily on support of general recreation and aquatic life. Samples to evaluate the bacteriological 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 public bathing use is generally the responsibility of state and/or local health departments.

Periodic low dissolved oxygen in parts of the lake has some impact the fishery and aquatic life support. However tiger muskie and walleye are stocked by NYSDEC, and the lake provides a good smallmouth bass and largemouth bass fishery. (DEC/DFWMR, Region 9, January 2007)

Appendix C- Long Term Trends: Findley Lake

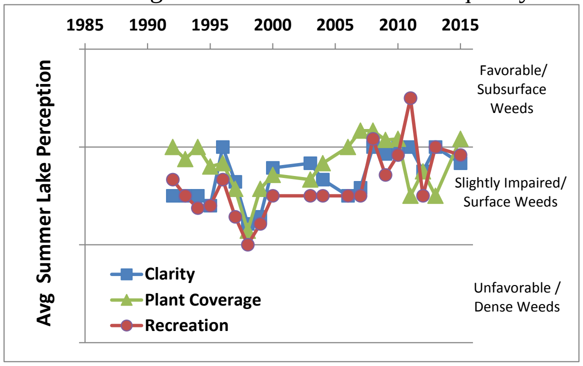
Long Term Trends: Water Clarity

- Variable but increasing clarity; lower in '15
- Most readings typical of *mesoeutrophic* lakes, consistent with chlorophyll readings



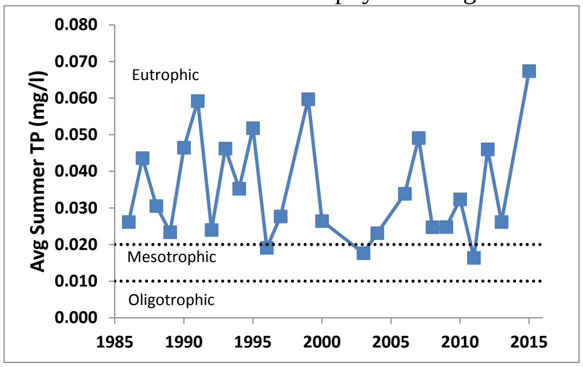
Long Term Trends: Lake Perception

- Improved perception recent years
- Recreational perception connected to changes in both weeds and water quality



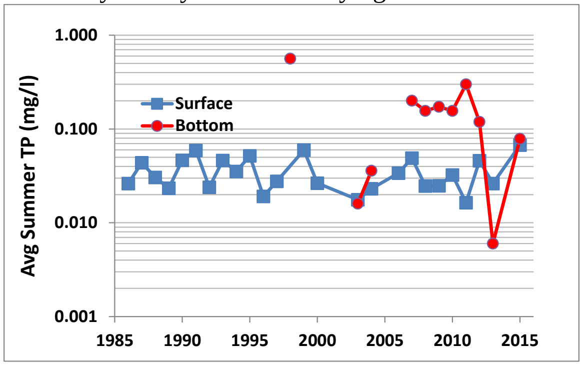
Long Term Trends: Phosphorus

- Highly variable; very high TP in 2015
- Most readings typical of *eutrophic* lakes, consistent with chlorophyll readings



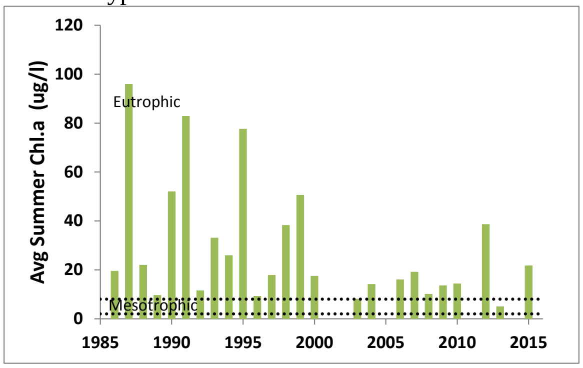
Long Term Trends: Bottom Phosphorus

- High bottom TP most years, but not 2015
- Difference in surface and bottom TP from year to year due to varying stratification?



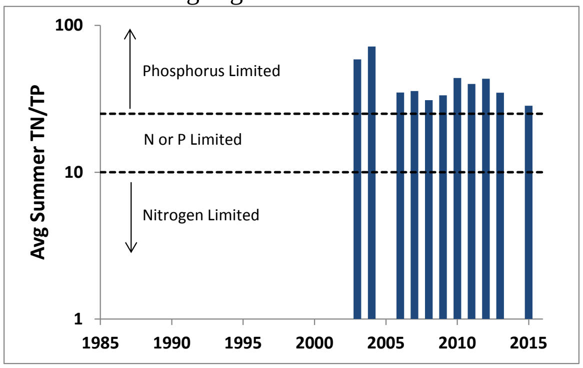
Long Term Trends: Chlorophyll a

- Decreasing open water algae levels
- Most readings typical of *eutrophic* lakes, and typical of lakes with shoreline blooms



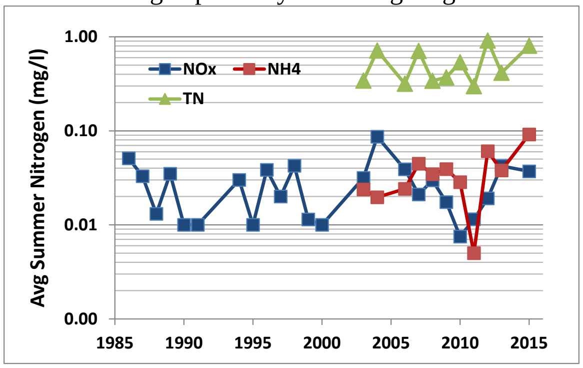
Long Term Trends: N:P Ratio

- May be decreasing N:P ratios
- Most readings indicate phosphorus likely limits algae growth



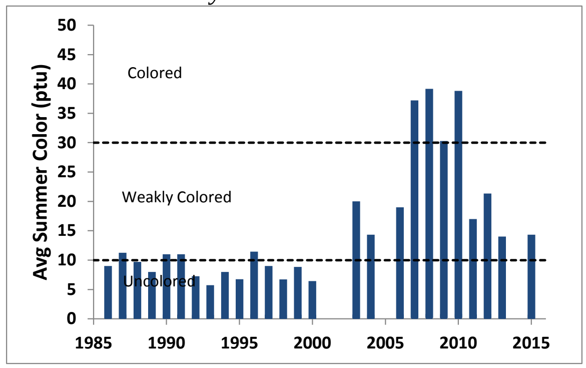
Long Term Trends: Nitrogen

- ↑ NH4 and TN; highly variable NOx
- Low NOx and ammonia, but higher total nitrogen probably due to high algae levels



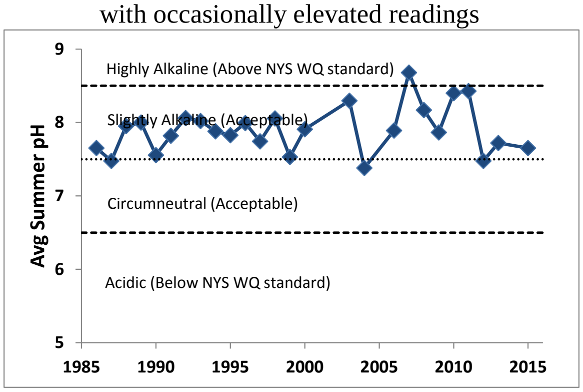
Long Term Trends: Color

- Recent decreases; higher readings post 2002
- Most readings typical of *weakly* to *moderately colored* lakes



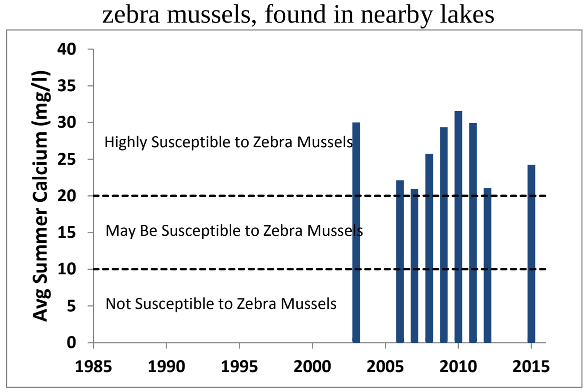
Long Term Trends: pH

- No long term trends apparent
- Most readings typical of *slightly alkaline* with occasionally elevated readings



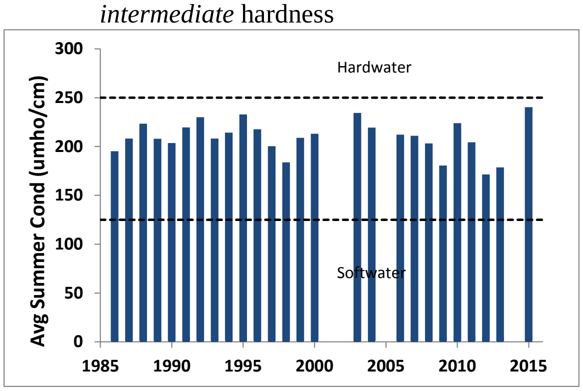
Long Term Trends: Calcium

- No trends yet apparent
- Most readings indicate high susceptibility to zebra mussels, found in nearby lakes



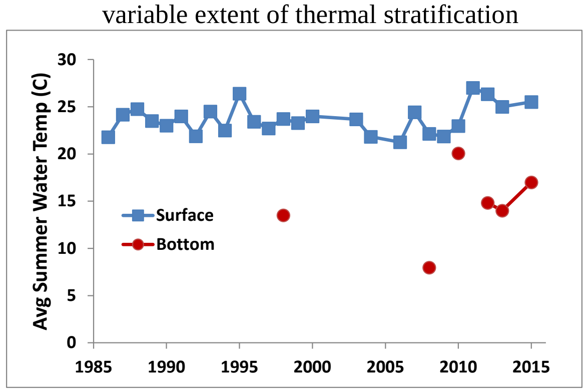
Long Term Trends: Conductivity

- Variable but higher in 2015
- Most readings typical of lakes with *intermediate* hardness



Long Term Trends: Water Temperature

- No long term trends but higher last few yrs
- Variable bottom temperatures may indicate variable extent of thermal stratification



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.

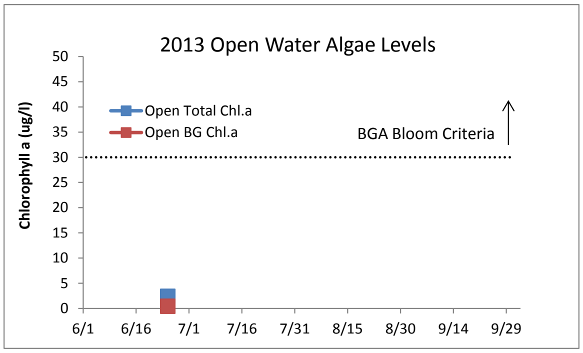


Figure D1:
2013 Open Water Total and BGA Chl.a

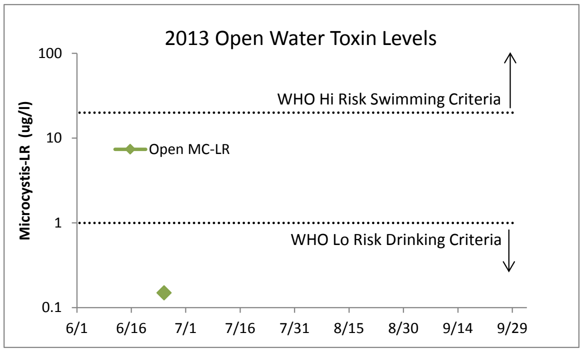


Figure D2:
2013 Open Water Microcystin-LR

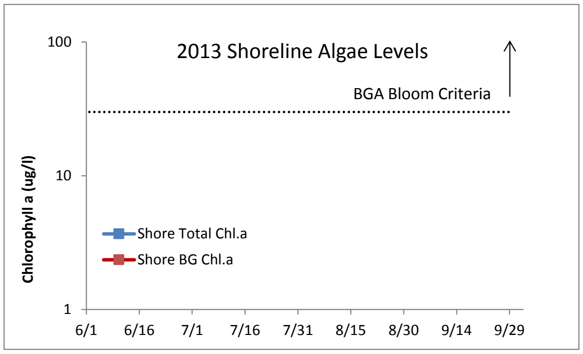


Figure D3:
2013 Shoreline Total and BGA Chl.a

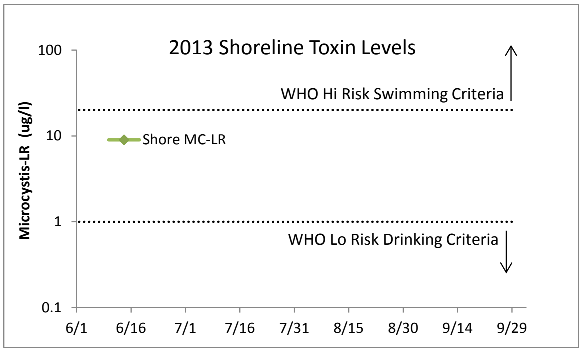


Figure D4:
2013 Shoreline Microcystin-LR

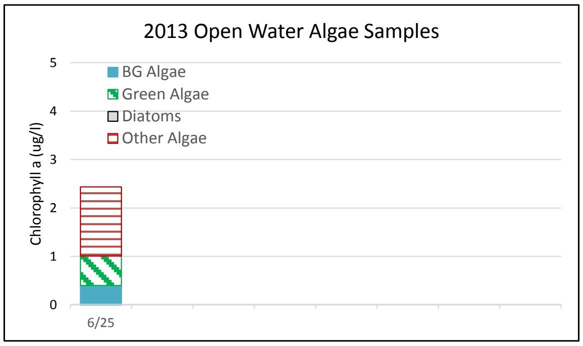


Figure D5:
2013 Open Water Algae Types

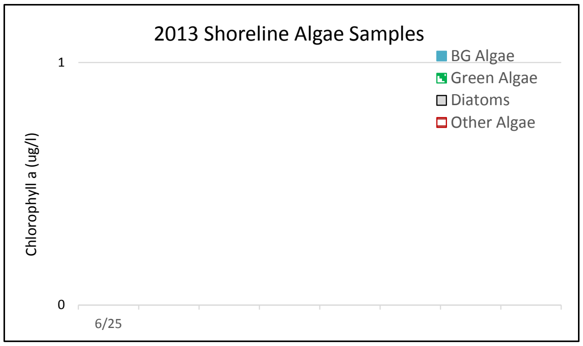


Figure D6:
2013 Shoreline Algae Types

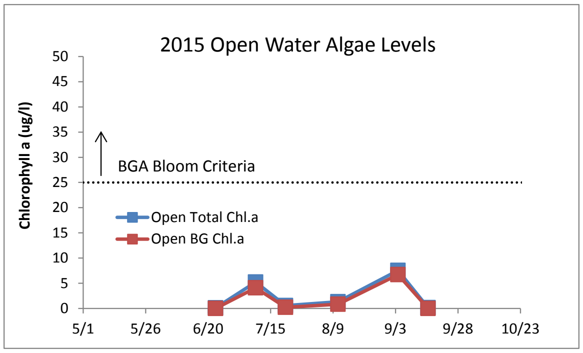


Figure D7:
2015 Open Water Total and BGA Chl.a

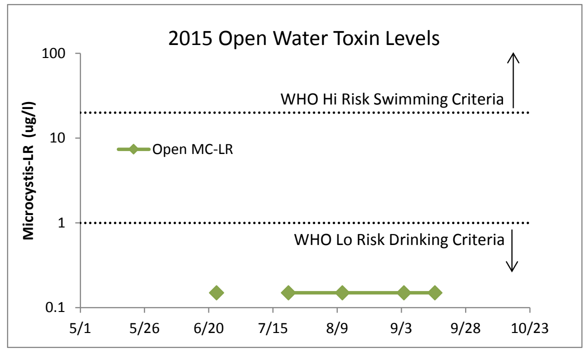


Figure D8:
2015 Open Water Microcystin-LR

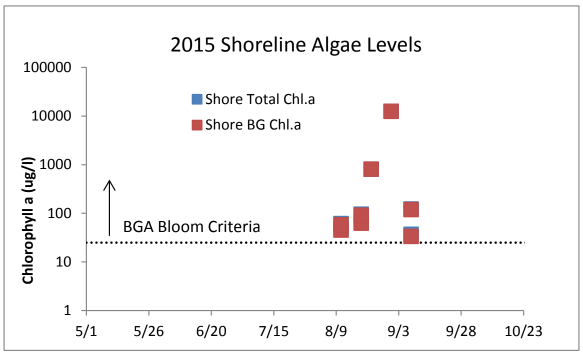


Figure D9:
2015 Shoreline Total and BGA Chl.a

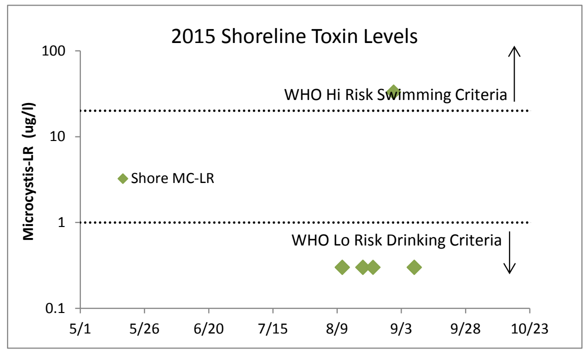


Figure D10:
2015 Shoreline Microcystin-LR

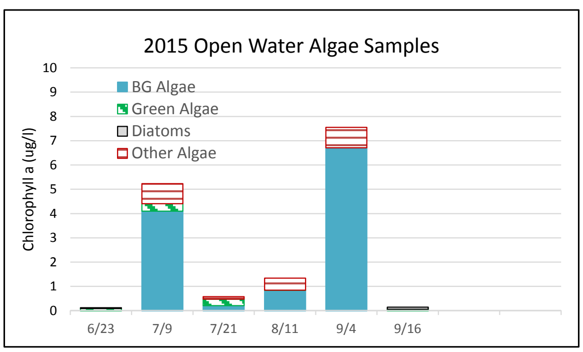


Figure D11:
2015 Open Water Algae Types

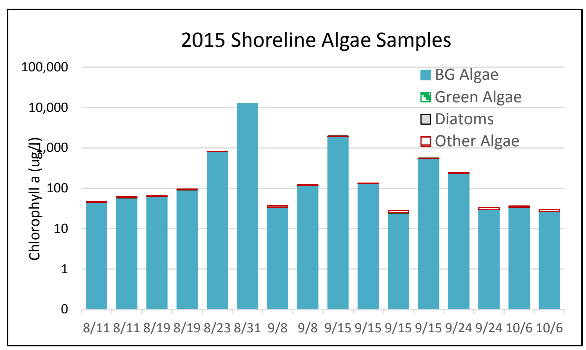


Figure D12:
2015 Shoreline Algae Types

Appendix E:
AIS Species in Chautauqua County

The table below shows the invasive aquatic plants and animals that have been documented in Chautauqua 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).

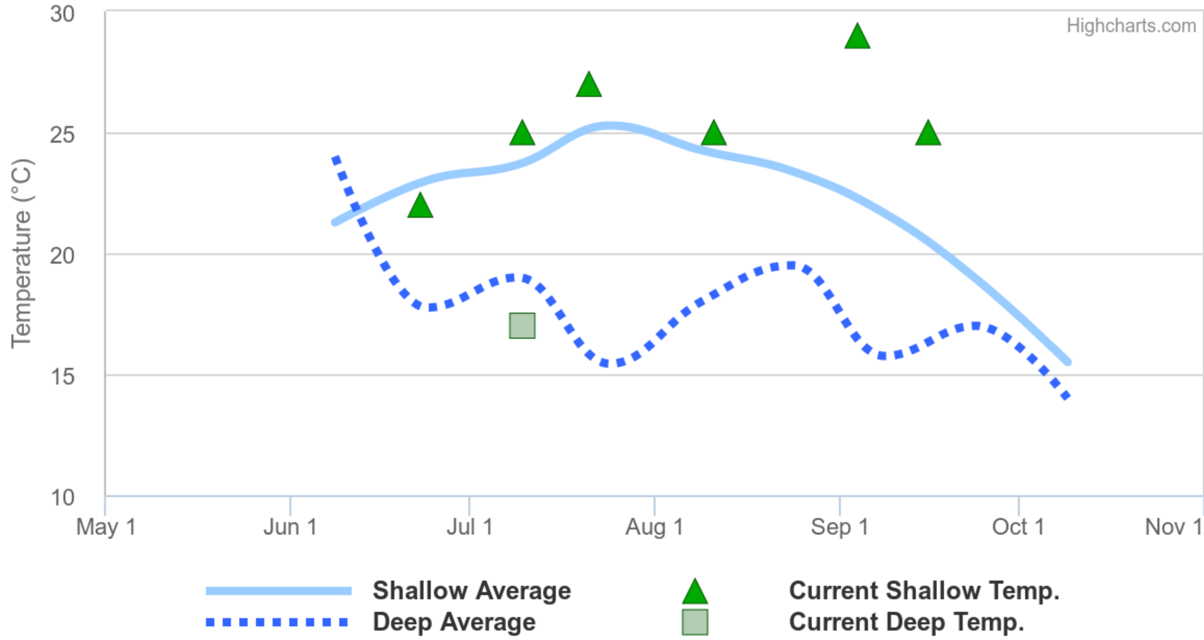
This list is not complete, but instead represents only those species that have been reported and verified within the county. If any additional aquatic invasive species (AIS) are known or suspected in these or other waterbodies in the county, this information should be reported through iMap invasives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

Aquatic Invasive Species - Chautauqua County			
Waterbody	**Kingdom**	**Common name**	**Scientific name**
Bear Lake	Animal	Common carp	*Cyprinus carpio*
Bear Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Bear Lake	Animal	Allegheny crayfish	*Orconectes obscurus*
Bear Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Brocton Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Brocton Reservoir	Plant	Curly leafed pondweed	*Potamogeton crispus*
Cassadaga Lakes	Animal	Common carp	*Cyprinus carpio*
Chautauqua Lake	Animal	Goldfish	*Carassius auratus*
Chautauqua Lake	Animal	Asian clam	*Corbicula fluminea*
Chautauqua Lake	Animal	Common carp	*Cyprinus carpio*
Chautauqua Lake	Animal	Zebra mussel	*Dreissena polymorpha*
Chautauqua Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Chautauqua Lake	Animal	Allegheny crayfish	*Orconectes obscurus*
Chautauqua Lake	**Plant**	**Curly leafed pondweed**	***Potamogeton crispus***
Chautauqua Lake	Plant	Water chestnut	*Trapa natans*
Clay Pond	Animal	Common carp	*Cyprinus carpio*
East Mud Lake	Plant	Brittle naiad	*Najas minor*
Findley Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Fredonia Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Lake Erie	Animal	Asian clam	*Corbicula fluminea*
Lake Erie	Animal	Quagga mussel	*Dreissena bugensis*
Lake Erie	Animal	Zebra mussel	*Dreissena polymorpha*
Lake Erie	Animal	Virile crayfish	*Orconectes virilis*
Lake Erie	**Animal**	**Spiny waterflea**	***Bythotrephes longimanus***

Waterbody	Kingdom	Common name	Scientific name
Lake Erie	**Animal**	**Fishhook waterflea**	***Cercopagis pengoi***
Lower Cassadaga Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Lower Cassadaga Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
Lower Cassadaga Lake	**Animal**	**Common carp**	***Cyprinus carpio***
Middle Cassadaga Lake	**Animal**	**Common carp**	***Cyprinus carpio***
Middle Cassadaga Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Middle Cassadaga Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*
North Harmony State Forest Pond	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Silver Creek Reservoir	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Upper Cassadaga Lake	Plant	Eurasian watermilfoil	*Myriophyllum spicatum*
Upper Cassadaga Lake	**Animal**	**Common carp**	***Cyprinus carpio***
Upper Cassadaga Lake	Plant	Curly leafed pondweed	*Potamogeton crispus*

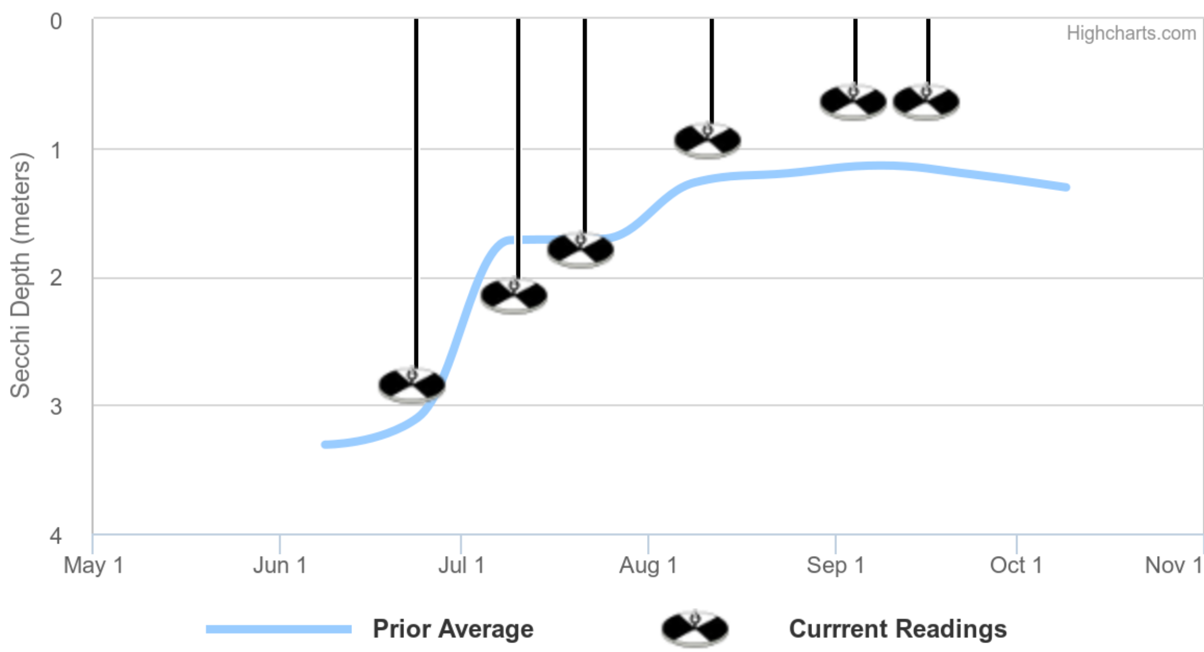
Appendix F: Current Year vs. Prior Averages for Findley Lake

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 1986 to 2013. There are not enough deep water sample temperatures to determine a trend for the current year when compared to the average of readings collected from 1998 to 2013.

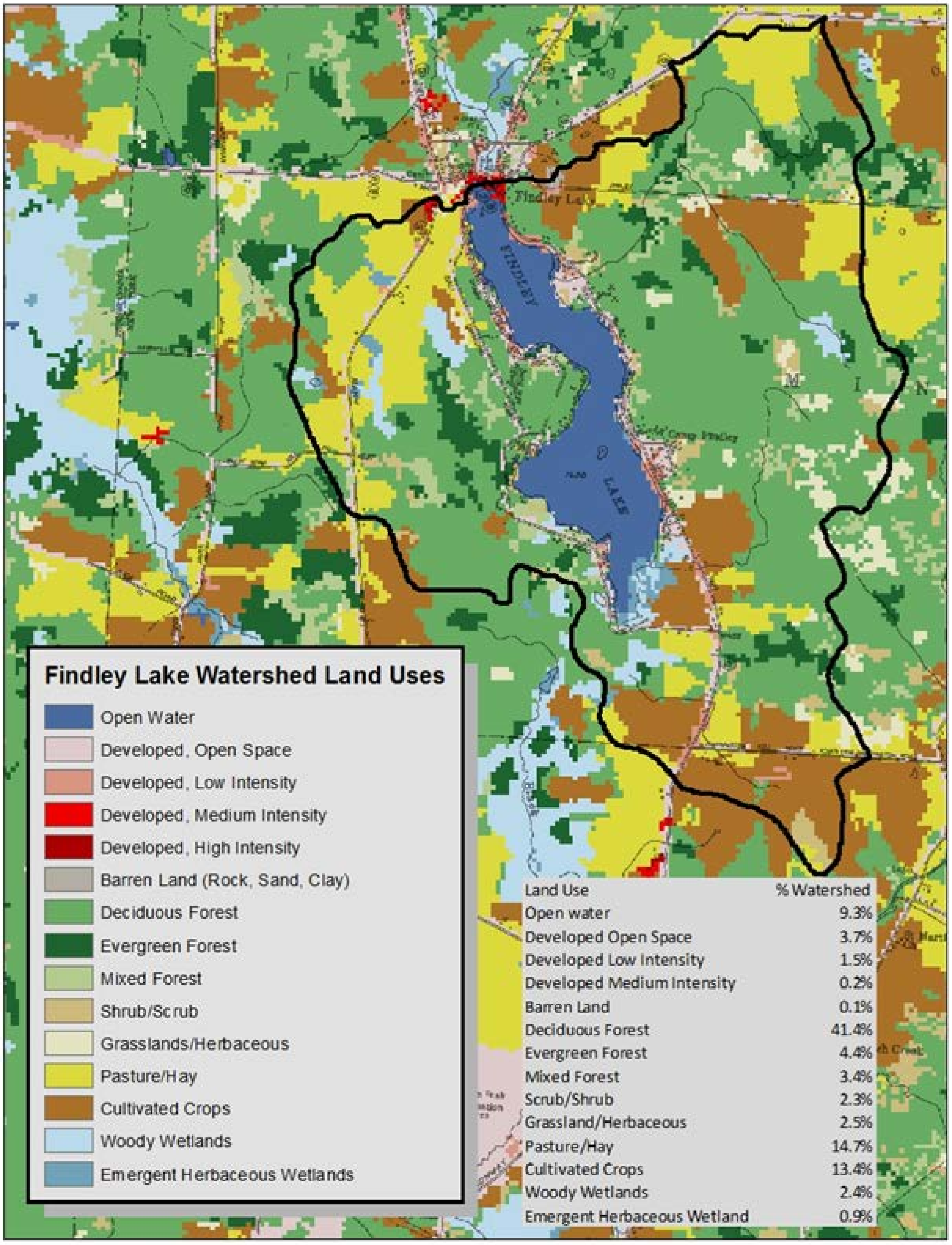
Current Year Secchi Readings vs. Prior Average



This year's session Secchi readings are about the same as the average of readings collected from 1986 to 2013

Appendix G: Watershed and Land Use Map for Findley Lake

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.



2015 Findley Lake Scorecard

Citizens Statewide Lake Assessment Program

Introduction

The Citizens Statewide Lake Assessment Program (CSLAP) is a volunteer lake monitoring and education program managed by DEC and the New York State Federation of Lake Associations (NYSFOLA). Lake information from a variety of sources, including CSLAP volunteers, is combined to create a scorecard for each CSLAP lake.

The purpose of the scorecard is to provide a quick and simple summary of sampling results for:

- water quality conditions
- biological health
- lake perception
- lake uses

The condition of each lake characteristic is represented by a color scale:

Blue Green Yellow Red Black

→

Best Worst

No color indicates the condition is not known due to insufficient data.

How information is turned into scores

CSLAP volunteers collect valuable lake water quality data using accepted scientific methods to evaluate nutrient enrichment, aquatic weed and algae growth, general lake conditions, and the recreational quality of a lake.

Water quality data is grouped and assigned scores related to the "health" (good or poor) of the lake. The scoring system is based on water quality standards, scientific principles and statistical analysis.

Tips for interpreting scorecard information

Each section of the scorecard includes a table identifying and describing lake characteristics and generally explains what they tell us about the lake's health. This table can be used to help interpret scorecard results.

Limitations of the information

Water quality assessments and summaries of lake perception provided in this scorecard are based on information collected by CSLAP, and could be different from assessments and summaries based on information collected by other sources.

Trend information (the positive or negative direction of lake health over time) is not available for every lake characteristic. Many years of data are needed to accurately assess trends. Trends are evaluated using statistical methods that are based on annual measurements. These methods separate short-term changes from long-term patterns, meaning a change from normal conditions in any one year may not represent a trend.

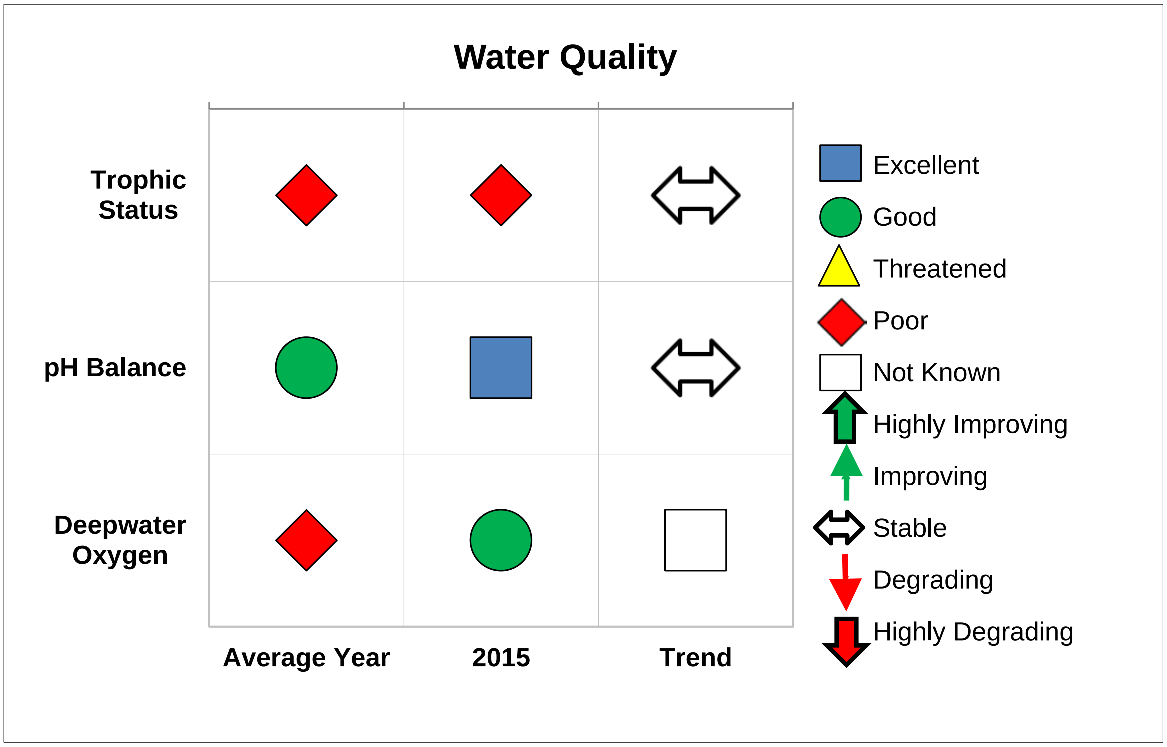
Biological health evaluations come from a variety of sources, including CSLAP. These evaluations will change as CSLAP biological data continues to be evaluated and as additional non-CSLAP information is provided to DEC and incorporated into the database.

Lake use assessments are made using state water quality standards and guidance values for a variety of water quality and use indicators, not just CSLAP data. Lake use assessments based solely on CSLAP data are incomplete.

2015 Findley Lake Scorecard
Citizens Statewide Lake Assessment Program

Water Quality Assessment

Water quality assessments are based on data collected from the deepest part of the lake every other week, for 15 weeks, from late spring through early fall. The data is used to evaluate a number of lake conditions, including algae growth (productivity or trophic status), pH and deepwater dissolved oxygen levels. There is not enough data to identify a trend in the deepwater oxygen levels for any CSLAP lake.



*All years of CSLAP data collection for the lake except those for which data was not available.

The following data is collected and analyzed to determine the water quality score.

Water quality characteristic	Score	Description of characteristic	What it means
Trophic Status	Total Phosphorus (TP)	TP is measured because it is an important nutrient that often controls the growth of algae and rooted plants.	Too much phosphorus can harm aquatic life, water supplies, and recreational uses by causing excessive algae growth.
	Chlorophyll *a*	Chlorophyll *a* is measured to estimate the amount of algae in a lake.	The amount of chlorophyll *a* is usually closely related to the amount of phosphorus and can affect water clarity.
	Secchi Disk	This is a device to measure how far down into the water you can see.	Water clarity is a strong indicator of the public's opinion of lake conditions.
pH Balance	pH	Water pH is measured to determine its acidity or alkalinity.	Values between 6 and 9 support most types of plant and animal life.
	Conductivity	Conductivity is measured to estimate the amount of dissolved and suspended solids in water, including salts and organic material.	High conductivity values may be related to geology or land use practices and can indicate susceptibility to changes in pH.
Deepwater Dissolved Oxygen	Phosphorus, ammonia, nitrite, iron, manganese, and arsenic	Dissolved oxygen (DO) is not measured directly, but can be inferred from the levels of certain chemicals in water samples collected near the lake bottom.	Dissolved oxygen is critical for the ecological balance of lakes. Low DO in bottom waters can affect the survival of fish and lake organisms and cause chemical changes in lakes.

2015 Findley Lake Scorecard
Citizens Statewide Lake Assessment Program

The water quality scores for each water quality characteristic are determined by the following:

Water quality characteristic	Score	Criteria Score Elements	How Criteria Are Used to Determine Score
Trophic Status	Excellent	Average value for each trophic indicator (water clarity, chlorophyll *a*, total phosphorus) assigned score of 3 if oligotrophic+, 2 if mesotrophic+, 1 if eutrophic+	Trophic score = 8 or 9 (two of three trophic indicators = oligotrophic, other is mesotrophic)
	Good		Trophic score = 6 or 7 (at least two trophic indicators = mesotrophic or "higher")
	Threatened		Trophic score = 4 or 5 (at least one trophic indicator = mesotrophic or "higher")
	Poor		Trophic score = 3 (all trophic indicators = "eutrophic")
pH Balance	Excellent	Average pH is evaluated against state water quality standards (should be above 6.5 and below 8.5) and average conductivity evaluated to determine if low buffering capacity against future pH change	pH between 7.5 and 8.5
	Good		pH between 7 and 7.5
	Threatened		pH above 8.5, pH between 6.5 and 7, or conductivity < 50 ug/l
	Poor		pH < 6.5
Deepwater Dissolved Oxygen	Excellent	Deepwater ammonia and phosphorus levels are compared to surface readings, and assigned a score of 3 if bottom readings are >10x surface readings and a score of 2 if bottom readings are >5x surface readings	Actual DO data indicating fully oxygenated conditions in stratified lakes to lake bottom
	Good		All shallow lakes assumed to be good absent data; deepwater scores = 1
	Threatened		Deepwater NH3 score + Deepwater TP score >3 or actual DO data indicating hypoxic conditions
	Poor		Deepwater NH3 score = 3 or actual DO data indicating anoxic conditions
	Not known		No deepwater O_2 or indicator data in stratified lake

+ trophic designations- oligotrophic = water clarity > 5 m, chlorophyll a < 2 ug/l, total phosphorus < 10 ug/l
mesotrophic = water clarity 2-5 m, chlorophyll a 2-8 ug/l, total phosphorus = 10-20 ug/l
eutrophic = water clarity < 2 m, chlorophyll a > 8 ug/l, total phosphorus > 20 ug/l

The water quality trends for each water quality characteristic and measure of lake perception are determined by the following:

Highly Improving: linear regression correlation coefficient (R^2) > 0.5 and p value < 0.01, with trend toward higher "score"

Improving: R^2 > 0.33 and p value < 0.05, or R^2 > 0.5 and p value < 0.05, or R^2 > 0.33 and p value < 0.01, with trend toward higher "score"

Stable: neither linear regression nor p value in statistically significant ranges as defined above

Degrading: R^2 > 0.33 and p value < 0.05, or R^2 > 0.5 and p value < 0.05, or R^2 > 0.33 and p value < 0.01, with trend toward lower "score"

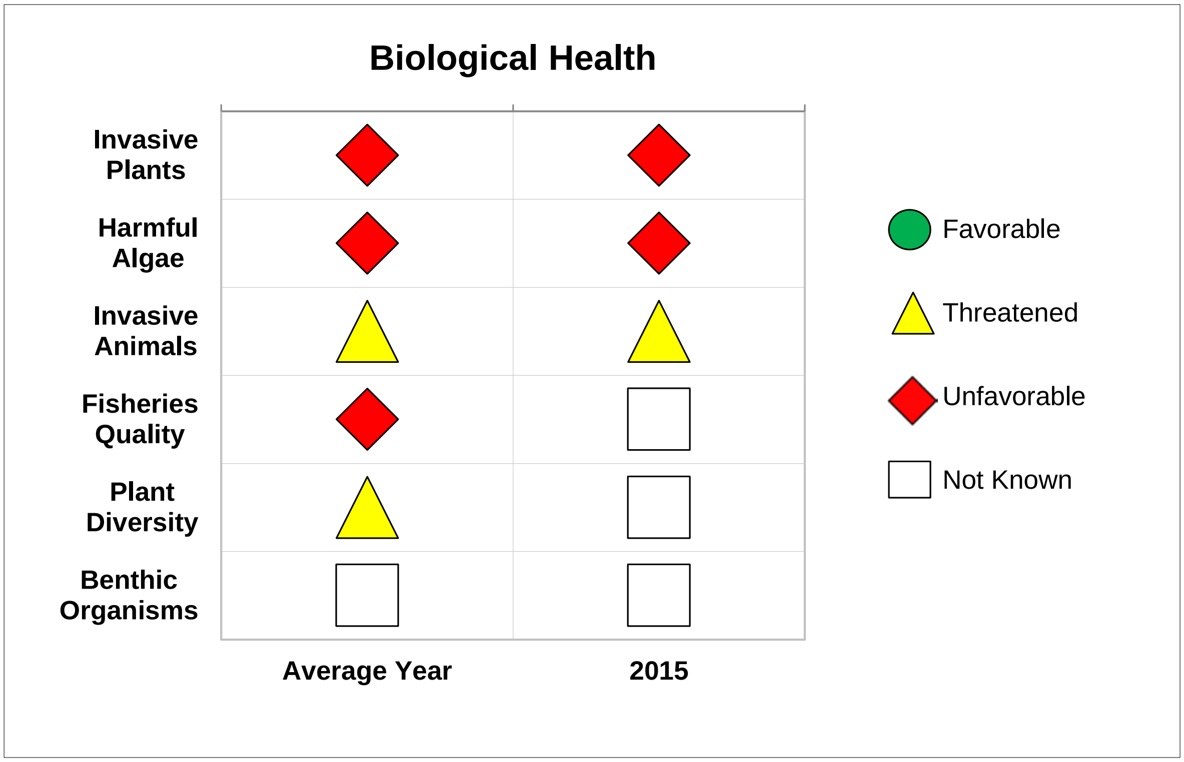
Highly Degrading: R^2 > 0.5 and p value < 0.01, with trend toward lower "score"

2015 Findley Lake Scorecard
Citizens Statewide Lake Assessment Program

Biological Health

Biological health of lakes can be evaluated in a number of ways. For CSLAP lakes, biological health evaluations are based on the presence of invasive plants, the type and number of blue-green harmful algal blooms, the presence of invasive animals (zebra mussels, spiny waterflea, etc.), the types of fish, aquatic plant diversity, and the number of pollution sensitive aquatic insects.

Biotic indices have been developed to evaluate a few biological health characteristics. Biotic indices are used to compare the biological community of the lake being sampled to the biological community of a known high-quality lake. (Data to support biological health assessments is not available for all CSLAP lakes.)



***** All years of CSLAP data collection for the lake except those for which data was not available.

2015 Findley Lake Scorecard
Citizens Statewide Lake Assessment Program

The following information is used to determine biological health scores.

Biological Health Characteristic	Description of characteristic	What it means
Invasive Plants	CSLAP volunteers survey lakes for nuisance, non-native plants (water chestnut, Eurasian water milfoil, etc.).	Abundant invasive plants can crowd out native and protected plants, create quality problems, and interfere with recreation. "Unfavorable" means at least one invasive plant species has been found. "Threatened" lakes are geographically close to an "infected" lake, or have water quality conditions that put them at higher risk for species invasion.
Harmful Algae	DEC and other biologists screen water samples for blue-green algae cell pigments and also test them for algal toxins.	Harmful algae can reduce oxygen levels and may cause harm to people recreating on the lake. "Unfavorable" means algal toxin readings are unsafe for water recreation; "threatened" means readings are approaching unsafe for water recreation.
Invasive Animals	DEC and other biologists survey lakes for nuisance, non-native animals (zebra mussels, spiny water flea, etc.).	Abundant invasive animals can harm native plant and animal species, influence the likelihood of algal blooms, and interfere with recreation. "Unfavorable" means at least one invasive animal has been found. "Threatened" lakes are geographically close to an "infected" lake, or have water quality conditions that put them at higher risk for species invasion.
Fisheries Quality	DEC and other fisheries biologists measure the length and weight of various species in a lake's fish community and conduct other measures of the health of the fisheries community.	Better fisheries quality indicates the lake has sufficient food resources and habitat to support its fish community. Several "biotic indices" are used to evaluate fish community quality.
Plant Diversity	CSLAP volunteers, academic researchers and consultants survey lakes for the number and types of aquatic plants.	Higher plant diversity indicates a more natural environment and helps prevent invasive species from taking over a lake. "Floristic quality indices" are used to evaluate plant communities.
Benthic Organisms	DEC and other biologists count and identify the types of bottom living (benthic) aquatic insects in a lake.	More pollution sensitive (intolerant) aquatic insects in a lake usually indicate good water quality and suitable habitat. "Biotic indices" are used to evaluate benthic communities.

2015 Findley Lake Scorecard

Citizens Statewide Lake Assessment Program

The biological health scores for each biological health characteristic are determined by the following:

Water quality characteristic	Score	Criteria Score Elements	How Criteria Are Used to Determine Score
Invasive Plants	Favorable	Aquatic plant surveys are conducted by CSLAP volunteers or by other organizations; invasive plants identified by plant expert	No evidence of invasive/exotic aquatic plants
	Threatened		Invasive plants found in nearby (<10 miles away) lakes or public launch is found on lake
	Unfavorable		Invasive/exotic aquatic plants found in lake
	Not Known		No aquatic plant surveys in lake (this year)
Harmful Algae	Favorable	Harmful algae bloom (HAB) sampling conducted in open water and along shoreline; total algae, algae species, phycocyanin (blue green pigment) and algal toxins analyzed in samples	All data show algae, phycocyanin and toxin levels below DEC bloom criteria+
	Threatened		Fluoroprobe or toxin levels exceed DEC threatened# criteria; phycocyanin levels exceed DEC bloom criteria, or visual evidence of blooms
	Unfavorable		Fluoroprobe or toxin levels exceed DEC bloom criteria in open water or shoreline
	Not Known		No HAB data available for lake
Invasive Animals	Favorable	Invasive animal (primarily zebra or quagga mussel) surveys are conducted on limited basis in CSLAP lakes; other AIS animals reported through iMapInvasives	No reports of invasive/exotic aquatic animals and no clear threats exist
	Threatened		Invasive animals found in nearby (<25 miles away) waterbodies AND public launch is found on lake, or calcium levels > 20 mg/l
	Unfavorable		Invasive/exotic aquatic animals found in lake
	Not Known		No information to evaluate presence of exotic animals
Fisheries Quality	Favorable	New York does not (yet) have a fish index for biotic integrity (IBI); for lakes with fishery survey data, Minnesota Fish IBI is used to evaluate fisheries quality	Fish IBI > 60 (= "good" and "excellent")
	Threatened		Fish IBI between 40 and 60 (= "fair")
	Unfavorable		Fish IBI < 40 (= "poor")
	Not Known		No fisheries data
Plant Diversity	Favorable	New York has not yet developed a floristic quality index (FQI); for lakes with detailed plant survey data, a modified version of the Wisconsin FQI and Florida aquatic plant designations are used for evaluating aquatic floristic quality	mFQI > 5 (= "good" quality), based on # genera
	Threatened		mFQI = 3-8 (= "fair" quality), based on # genera
	Unfavorable		mFQI < 3 (= "poor" quality), based on # genera
	Not Known		Insufficient plant survey data to evaluate
Benthic Organisms	Favorable	New York has not yet developed a macroinvertebrate IBI; for lakes with detailed macroinvertebrate survey data, Vermont IBI is used to evaluate benthic organism quality	IBI > 10-15 (based on # genera)
	Threatened		IBI between 8 and 15 (based on # genera)
	Unfavorable		IBI < 8
	Not Known		Insufficient macroinvertebrate data to evaluate benthic organisms quality

+ DEC bloom criteria- fluoroprobe blue green algae chlorophyll a = 30 ug/l
phycocyanin = 200 units
algal toxins- microcystin-LR = 20 ug/l ("high toxins") along shoreline, = 10 ug/l in open water

+ DEC threatened criteria- fluoroprobe blue green algae chlorophyll a = 10 ug/l
algal toxins- microcystin-LR = 4 ug/l along shoreline or in open water

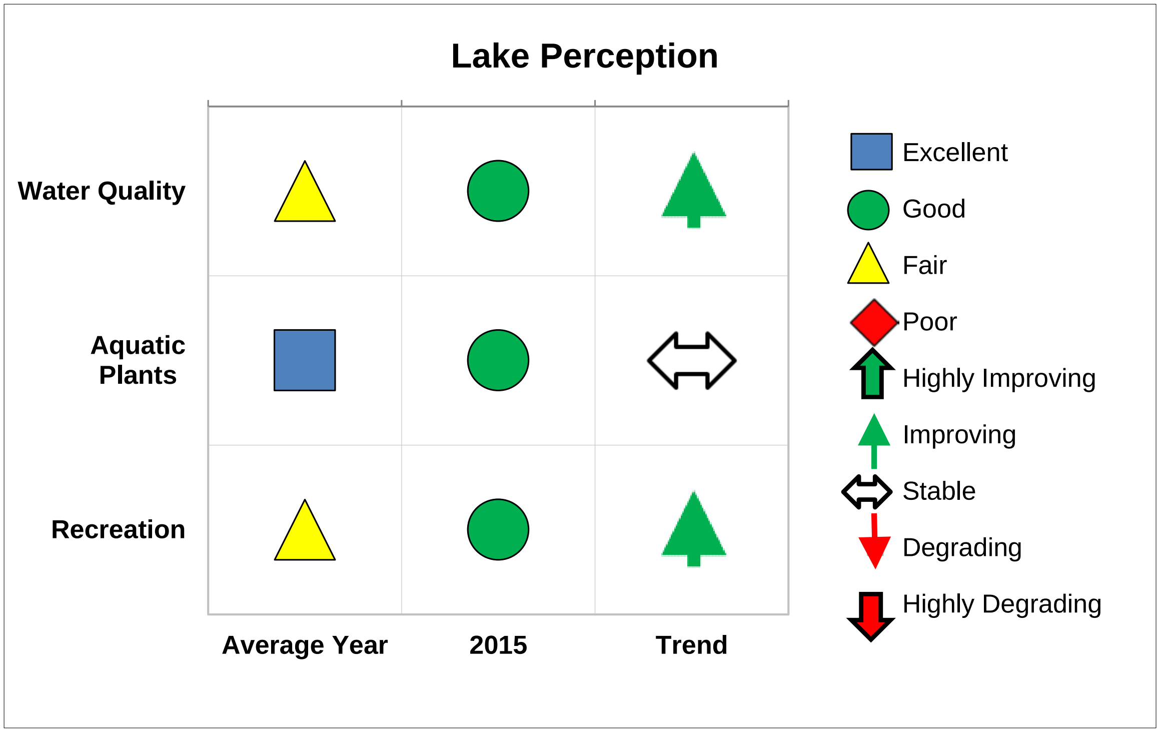
2015 Findley Lake Scorecard

Citizens Statewide Lake Assessment Program

Lake Perception

Lake perception scores are based on the visual observations of CSLAP volunteers who answer questions on the Field Observation Form (http://www.dec.ny.gov/docs/water_pdf/cslapsamobs.pdf) completed during sampling. The questions ask the volunteer to determine their perceptions of how clear the water looks, the abundance of aquatic plants, conditions affecting current recreational use, and the overall recreational quality of the lake.

Visual observations are very closely connected to measured water quality conditions. This information is helpful to lake managers in deciding on nutrient criteria, or the amount of nutrients that can flow into a lake without compromising its water quality. For New York State lakes, perception data collected by CSLAP volunteers is critical to the development of nutrient criteria (defining "how much is too much") and has been consistently collected by CSLAP volunteers since 1992.



* All years of CSLAP data collection for the lake except those for which data was not available.

The following information is used to determine the lake perception scores.

Lake Perception Characteristic	Description of characteristic	What it means
Water Quality	Asks the user: How clear does the water look today?	Clearer water usually indicates lower nutrient levels.
Aquatic Plants	Asks the user: How abundant are aquatic plants where people are boating and swimming today?	Lower abundances of aquatic plants usually provide proper ecological balance and are less likely to contribute to recreational use problems, although the absence of plants can also lead to lake problems. Lakes with the most favorable assessments have some plants, but not too many plants.
Recreation	Asks the user: What is your opinion of the recreational quality of the lake? What factors affect your perception of the lake?	Users' perceptions are associated with water quality conditions and aquatic plant coverage. Positive responses usually indicate good water quality and little to no surface plant coverage. Negative responses are usually associated with poor water quality and/or invasive plants.

2015 Findley Lake Scorecard

Citizens Statewide Lake Assessment Program

The lake perception scores for each lake perception characteristic are determined by the following:

Lake perception characteristic	Score	Criteria Score Elements	How Criteria Are Used to Determine Score
Water Quality	Excellent	Water quality perception is evaluated on a 5 point scale during each CSLAP sampling session, ranging from "crystal clear" (=1) to "severely high algae levels" (=5); average values are computed	Average value < 1.5
	Good		Average value >1.5 and <2.5
	Fair		Average value >2.5 and <3.5
	Poor		Average value >3.5
Aquatic Plants	Excellent	Aquatic plant coverage is evaluated on a 5 point scale during each CSLAP sampling session, ranging from "not visible at lake surface" (=1) to "plants densely cover surface except in deepest areas" (=5); average values are computed	Average value >2 and <2.5
	Good		Average value >1.5 and < 2 OR > 2.5 and <3
	Fair		Average value >3 and <3.5 OR <1.5
	Poor		Average value > 3.5
Recreation	Excellent	Recreational conditions are evaluated on a 5 point scale during each CSLAP sampling session, ranging from "beautiful…could not be nicer" (=1) to "lake not usable" (=5); average values are computed	Average value < 1.5
	Good		Average value >1.5 and <2.5
	Fair		Average value >2.5 and <3.5
	Poor		Average value >3.5

+ lake assessments- **water quality** = 1 = crystal clear, 2 = not quite crystal clear, 3 = definite algae greenness, 4 = high algae levels, 5 = severely high algae levels
aquatic plants = 1 = no plants visible, 2 = plants below surface, 3 = plants at surface, 4 = plants dense at surface, 5 = surface plant coverage
recreation = 1 = could not be nicer, 2 = excellent, 3 = slightly impaired, 4 = substantially impaired, 5 = lake not usable

The water quality trends for each water quality characteristic and measure of lake perception are determined by the following:

Highly Improving: linear regression correlation coefficient (R^2) > 0.5 and p value < 0.01, with trend toward higher "score"

Improving: R^2 > 0.33 and p value < 0.05, or R^2 > 0.5 and p value < 0.05, or R^2 > 0.33 and p value < 0.01, with trend toward higher "score"

Stable: neither linear regression nor p value in statistically significant ranges as defined above

Degrading: R^2 > 0.33 and p value < 0.05, or R^2 > 0.5 and p value < 0.05, or R^2 > 0.33 and p value < 0.01, with trend toward lower "score"

Highly Degrading: R^2 > 0.5 and p value < 0.01, with trend toward lower "score"

2015 Findley Lake Scorecard

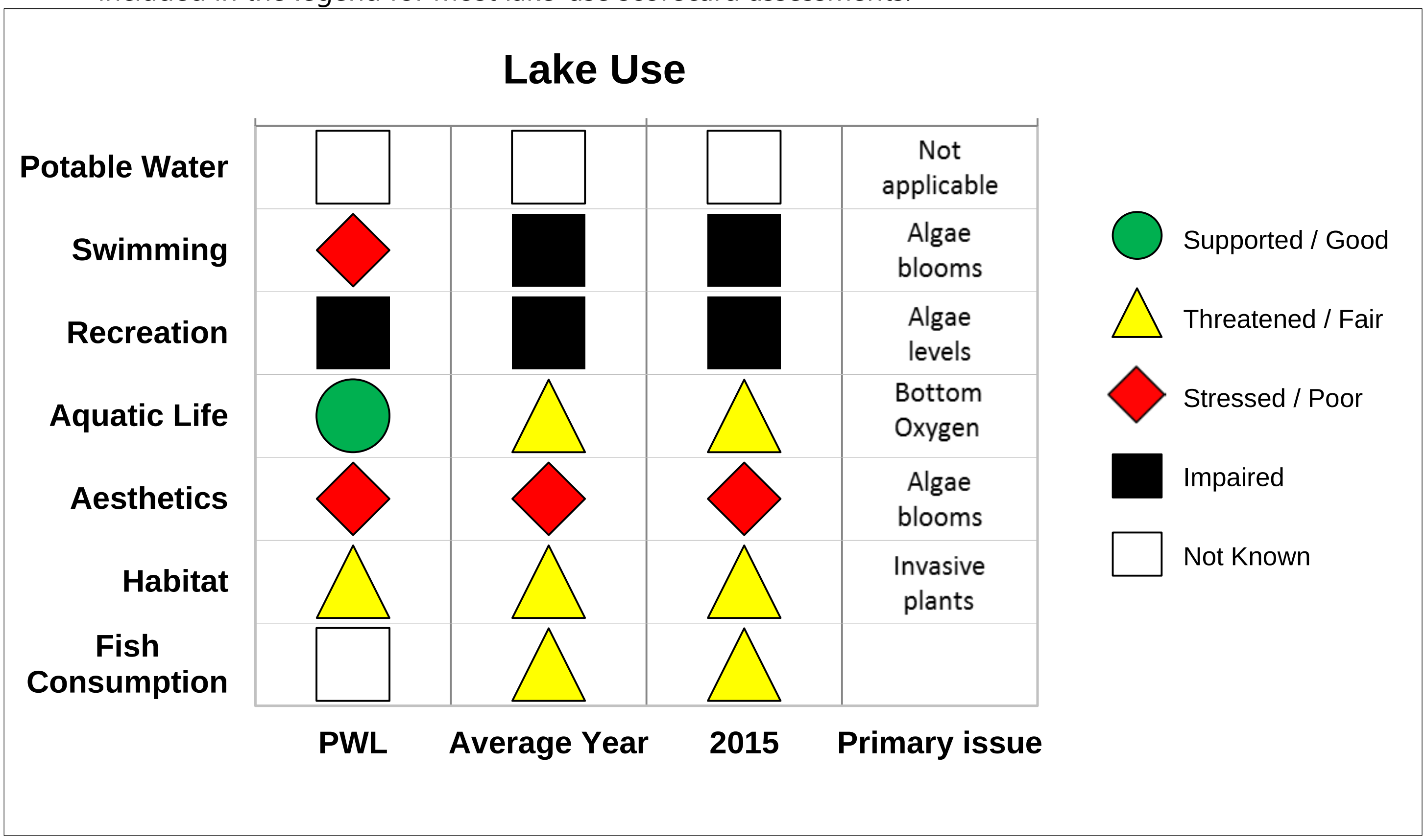
Citizens Statewide Lake Assessment Program

Lake Uses

Lake uses are defined as the best uses for a lake (drinking water, swimming, etc.) as determined by several factors. Lake uses are identified using CSLAP water quality, lake perception and biological assessment information to evaluate where a lake fits in the state Water Quality Standards and Classification system (see overview below).

Each lake use is scored based on the following assessment categories, using assessment methodology (http://www.dec.ny.gov/chemical/23846.html) established by DEC to evaluate impacts to lake uses:

- **Supported**- no evidence of impacts to lake use;
- **Threatened**- no evidence of impacts to lake use, but some factor threatens this use (for example, changing water quality, conditions that are nearing impact levels, land-use changes, etc.);
- **Stressed**- occasional or slight impacts to lake use;
- **Impaired**- frequent or persistent conditions limit or restrict lake use; and
- **Precluded**- conditions prevent lake use. This category is uncommon in NYS (and CSLAP) lakes and is not included in the legend for most lake-use scorecard assessments.



* All years of CSLAP data collection for the lake except those for which data was not available.

Overview of the typical water quality classification and their best uses. For more information visit www.dec.ny.gov/regs/4592.html#15990

Best use	Other uses	Water Quality Classification
Drinking	Bathing, swimming (recreation), fishing, and fish, shellfish and wildlife reproduction and survival	Class AA & A
Bathing	Swimming (recreation), fishing, and fish, shellfish and wildlife reproduction and survival	Class B
Swimming	Same as Class B	Class C
Fishing	Same as Class B and C	Class D

2015 Findley Lake Scorecard

Citizens Statewide Lake Assessment Program

The following information is used to determine the condition of lake uses.

Lake Use	**Description of characteristic**	**How this relates to CSLAP**
Potable Water	The lake is used for drinking water. Only Class AA and A lakes have been approved for this use.	CSLAP data is not intended to assess the condition of potable water. Other state and local monitoring programs better address this use. However, some CSLAP parameters–chlorophyll *a*, ammonia, arsenic, iron, manganese, algal toxins–indicate potential impacts to potability.
Bathing	The lake is used for swimming and contact recreation. This use is assessed in some lakes only if they support a public bathing beach, although it is evaluated in all lakes	Several CSLAP sampling indicators–water clarity, chlorophyll *a,* algal toxins, lake perception–can be used to assess swimming conditions.
Recreation (Swimming, Boating, Fishing and non-contact use)	The lake is used for swimming, boating, fishing and non-contact recreation. Even though some lakes are not classified for this use, all CSLAP lakes should support this use, consistent with the federal goal to make all lakes "fishable."	Contact recreation is evaluating using the bathing indicators described above. Non-contact recreation is evaluated using the lake perception data (visual observations) and aquatic plant surveys.
Aquatic Life	The lake is used by aquatic life. This is not an official "use" designated by New York State, but water quality standards and other criteria are adopted to protect aquatic life.	Aquatic life impacts can be evaluated by a number of CSLAP indicators, including pH, dissolved oxygen, and the presence of invasive species.
Aesthetics and Habitat	The lake is used for visual enjoyment or the visual beauty of the lake. This is not an official "use" designated by New York State, but water quality criteria are adopted to protect aesthetics.	Lake aesthetics can be impacted by a number of factors, including algal blooms, nuisance weeds, or simply reports that "the lake looks bad," all of which are evaluated in CSLAP. Lake habitat is evaluated against the presence and management of exotic plants
Fish Consumption	The lake is used for consumption of fish. All lakes are assumed to support this use unless otherwise indicated.	CSLAP does not collect data or information to evaluate fish consumption. All CSLAP lakes are evaluated against the New York State Department of Health: Health Advice on Eating Fish You Catch (http://www.health.ny.gov/environmental/outdoors/fish/health_advisories/).

For many CSLAP lakes, some of the lakes designated uses have previously been evaluated; a summary of these assessments can be found on the DEC Priority Waterbody List (PWL) developed for each of the 17 major drainage basins in the state. These can be found at http://www.dec.ny.gov/chemical/23846.html. For some lakes, these are derived from historical assessments of CSLAP or other water quality data, while for others, no PWL assessments are yet available. The "rules" for these assessments are cited in the state Consolidated Assessment and Listing Methodology (CALM) (http://www.dec.ny.gov/chemical/23846.html) have changed several times over the last decade, and the CALM document continues to be updated as new assessment tools are evaluated and adopted. The first column of the scorecard reflects the most recent PWL assessment, if available, for each CSLAP waterbody. Non CSLAP data, including "institutional" data (treated water data, bacterial data, consumer confidence report (CCR) summaries, and need for enhanced treatment) may be used for PWL assessments, but are not summarized here.

2015 Findley Lake Scorecard
Citizens Statewide Lake Assessment Program

The lake use scores for each lake use characteristic are determined by the following:

Lake Use	Score	Criteria Score Elements	How Criteria Are Used to Determine Score
Potable Water	Supported	Surface water chlorophyll a and HABs data, and deepwater metals data are used to evaluate potable water use. Waterbodies not classified as potable water supplies cited as “not known” (with impacts cited as “not applicable”	No evidence of any criteria violations (see below)
	Threatened		Avg hypolimnetic NH_4 > 1, Fe > 0.5, As > 0.3, or Mn >1; avg open water MC-LR > 0.5
	Stressed		>10d consec. open MC-LR>0.3 or BGA>30; Avg hypolimnetic NH_4 > 2, Fe > 1 or Mn >1; avg open water MC-LR > 1,
	Impaired		Avg chl.a > 4 (Class AA)-6 (Class A) ug/l, hypo. arsenic > 10 ug/l, violation of MCLs, municipal shut-down, or excessive water treatment needed
	Not known		No chlorophyll or deepwater nutrient data
Bathing	Supported	Surface water chl a, water clarity, and HABs data used to evaluate bathing use. Bathing assessments included here reference bathing criteria cited in the PWL; “public bathing” is evaluated with bacteria and DOH beach data and is reflected in the assessment information here (if available) but not quantified	No evidence of any criteria violations (see below)
	Threatened		Statistically significant WQ degr.; infrequent or single small site MC-LR>20 or shore BG >25-30
	Stressed		>10% water clarity readings < 1.2m; or single shoreline bloom MC-LR > 20; or open BG Chl > 30; recreation = “impaired” w/beach present
	Impaired		Open MC-LR > 20 ug/l or avg Secchi < 1.2m; or multiple site and persistent shore MC-LR > 20 or shore BG Chl > 25-30; beach closure > 4 wks or control needed
	Not known		No chlorophyll, clarity, HAB or perception data
Recreation	Supported	Surface water chl a, water clarity, and HABs data used to evaluate bathing use. Bathing assessments included here reference bathing criteria cited in the PWL; “public bathing” is evaluated with bacteria and DOH beach data and is reflected in the assessment information here (if available) but not quantified	No evidence of any criteria violations (see below)
	Threatened		Same as bathing or avg TP > 20 ug/l; >25% slightly impaired frequency recreation AND > 10% poor clarity triggering slight impairment
	Stressed		Same as bathing or >10% Chl.a samples > 10 ug/l
	Impaired		Same as bathing or Avg chl.a > 10 ug/l
	Not known		No chlorophyll, clarity, HAB or perception data
Aquatic Life	Supported	pH, (inferred) dissolved oxygen, and the presence of AIS species are used to evaluate aquatic life	No evidence of any criteria violations (see below)
	Threatened		Inferred/measured DO < 1; 10% pH < 6.5 or >8.5
	Stressed		Avg DO < 6.5 or > 8.5; inferred/measured DO < 1 for Class T/TS
	Impaired		Avg pH < 6 or >9; Avg DO < 6.5 or > 8.5 w/documented fish impacts; inferred/measured DO <1 w/documented fish impacts
	Not known		No pH, DO, or AIS information available

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Lake Use	Score	Criteria Score Elements	How Criteria Are Used to Determine Score
Aesthetics / Habitat	Good	Aesthetics are evaluated through perception surveys and the presence of HABs and native species, while habitat is evaluated against AIS species. These categories are not recognized by EPA as designated uses, so they are evaluated as a "condition".	No evidence of any criteria violations (see below)
	Fair		Occasional aquatic plant treatment required for invasive (habitat) or native (aesthetics) plants; Aesthetics: "slightly impaired" due to algae or weeds >25%; "definite algae greenness" >25%; 1x open water or shoreline bloom notification; >25% surface weeds; >10% TP samples > 20 ug/l
	Poor		Routine aquatic plant treatment required for invasive (habitat) or native (aesthetics) plants; Aesthetics: "slightly impaired" due to algae or weeds >50%; "definite algae greenness" >50%; > 1x open water or large or widespread shoreline bloom notification; > 50% surface weeds; avg TP > 20 ug/l
	Not known		No perception, HAB or AIS information
Fish Consumption	Supported	Fish consumption is not evaluated through CSLAP- PWL listings are based on whether a waterbody is cited on the DOH Health Advice for Consumption of	No evidence of any criteria violations (see below)
	Threatened		High toxins in any HAB sample or persistent BGA blooms
	Stressed		Fish tissue data indicates measurable level of contaminants but no listing on DOH Health Advice on Eating Sports Fish and Game
	Impaired		Waterbody cited on DOH Health Advice on Eating Sports Fish and Game
	Not known		No fish tissue data; potential impacts not cited

+ proposed NNC (numeric nutrient criteria): for potable water: Class AA lakes: chlorophyll a = 4 ug/l; for Class A lakes = 6 ug/l;
proposed NNC (numeric nutrient criteria) for swimming: chlorophyll a = 10 ug/l (all classes); water clarity = 1.2 meters (= 4 feet), TP = 20 ug/l

Summary

The information displayed in the scorecard is intended to give a quick and comprehensive overview of the results from CSLAP assessments and lake data collected by DEC, academics and private consultants.

CSLAP scorecards summarize information related to water quality, lake perception, biological condition and lake uses. The data and other information collected through CSLAP, or other sources, contribute to the evaluation of lake uses.

This information is the basis for the water quality assessments conducted as part of DEC's waterbody inventory. More comprehensive summaries of CSLAP data are included in individual lake reports and regional and statewide CSLAP data summaries. To fully understand CSLAP lakes, those interested should review the information found in scorecards, individual lake summaries, and regional and statewide CSLAP reports.

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CSLAP individual lake reports can be found on the Water Reports by County page of DEC's website (http://www.dec.ny.gov/lands/77821.html). Historical reports and regional lake reports are available on the New York State Federation of Lake Associations website (http://nysfola.mylaketown.com/).

More information about CSLAP and NYS Lakes

Many resources are available to lake associations and citizens interested in lake management and ecology on DEC's website, including:

- Information about CSLAP history, sampling activities, forms, and lake association resources are available on DEC's Citizens Statewide Lake Assessment Program web page (http://www.dec.ny.gov/chemical/81576.html).
- Measured water quality variable fact sheets (http://www.dec.ny.gov/docs/water_pdf/cslaplkpara.pdf)
- Lake management publication, *Diet for a Small Lake* (http://www.dec.ny.gov/chemical/82123.html)
- DEC Google Maps and Earth data, including CSLAP Lakes (http://www.dec.ny.gov/pubs/42978.html)
- Boating in NYS (http://www.dec.ny.gov/outdoor/349.html)
- Fishing in NYS (http://www.dec.ny.gov/outdoor/fishing.html)
- Freshwater Fishes of NY (http://www.dec.ny.gov/animals/269.html)
- Lake Contour Maps (http://www.dec.ny.gov/outdoor/9920.html)
- NYS Watersheds, Lakes and Rivers (http://www.dec.ny.gov/lands/26561.html)
- Fish Health Advisories (http://www.dec.ny.gov/outdoor/7736.html)
- Routine Statewide Monitoring Program (water quality monitoring programs) (http://www.dec.ny.gov/chemical/23848.html)
- Common Aquatic Invasive Species of NY (http://www.dec.ny.gov/animals/50272.html)

Findley Lake Questions and Answers, 2015 CSLAP

Q1. What is the condition of our lake this year?
A1. The condition of Findley Lake was probably similar in 2015 to previous years. Water clarity was again low, and while phosphorus readings were slightly higher than usual, algae levels were slightly lower, suggesting normal variability. Persistent shoreline blooms were reported in late summer, particularly along the north and west shoreline.

Q2. Is there anything new that showed up in the testing this year?
A2. Chloride testing results are typical of lakes with moderate impacts from road salt runoff, although no biological impacts have been reported or measured.

Q3. How does the condition of our lake this year compare with other lakes in the area?
A3. Findley Lake had lower water clarity, and higher nutrient and algae levels, than most other nearby lakes. Aquatic plant coverage was slightly lower than the plant coverage in many other nearby lakes.

Q4. Are there any trends in our lake's condition?
A4. Water clarity has increased slightly over the last thirty years (though slightly lower in 2015), perhaps leading to improved water quality and recreational assessments. Shoreline blooms were persistent, although it is not yet known if this is a new or continuing phenomenon.

Q5. Should we be concerned about the condition of our lake? Are we close to a tipping point?
A5. Findley Lake has shown a high susceptible to shoreline blue green algae blooms, consistent with high nutrient and open water algae levels. The lake association should continue to evaluate manageable shoreline and watershed sources of nutrients, as noted below.

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 improve 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.