

GARDNER LAKE AUTHORITY

270 Hartford Road
Salem, CT 06240

Meeting Minutes of May 14, 2015
Salem Town Hall

The meeting was called to order at 7:04 p.m.

Attendees

Bozrah: Henry Granger, Scott Soderberg, Jim McArdle
Montville: Bill Wrobel, Kate Johnson, Mike Magliano
Salem: Bob Neddo, Russ Smith, Larry Harrington

Russ Smith, Chair, noted a quorum.
Guests in attendance: 2

Minutes

The minutes of the April 9, 2015 meeting were presented. Jim McArdle made a motion to accept the minutes as presented; seconded by Mike Magliano. The motion was unanimously accepted.

Attachments

- Treasurer's Report from 3/16/2015 through 4/15/2015
- Ecosystems Consulting Service 2014 Study Report

Correspondence & Communications

- **Ecosystems Consulting Service 2014 Study Report:** Hard copies were distributed.
- **Ecosystems Consulting Service 2015 Contract:** The contract approved at the March meeting, in the amount of \$4,600, has been signed and returned to ECS.
- **Communications with Mike Payton, DEEP:** An application for marker permit(s) must be submitted to DEEP for the Slow-No-Wake-Zone by Minnie Island. (see Old Business)
- **P2View:** The DEEP quarterly newsletter was received.

Treasurer's Report

Presented by Scott Soderberg. Larry Harrington made a motion to accept the Treasurer's Report as presented; seconded by Henry Granger. The motion passed unanimously.

Committee Business

- Law Enforcement Patrol:** Bill Wrobel reported. Bill has spoken with Boating Patrolman Gregg Jacobson and Montville Mayor Ron McDaniel regarding the ongoing staffing problems. Montville continues to experience staffing difficulties. Lieutenant Leonard Bunnell of the Montville Police Dept. is also aware of the urgent need to have patrols on the lake this season. Bill will check with the Mayor to see what arrangements are being made for coverage for the Memorial Day Weekend. A letter will be sent to the three Town Chief Officials, Commissioner of DEEP, Rob Klee, and DEEP Boating Safety in Old Lyme, sharing GLA's concerns and requesting recommendations about the lack of coverage.
- Boating:** Bob Neddo confirmed the number of people completing the Boating Safety Course this spring was sixteen. The summer course will be held at the Gardner Lake Fire Department, 429 Old Colchester Road, Route 354, Salem, on July 7, 9 and 14 from 5:45 p.m. to 9:00 p.m. The cost to attend is \$15 per person, payable to GLFD. A certificate will be issued upon completion, which will need to be turned into the State. An additional one-time fee of \$50 will be collected by DEEP when the license is issued. To register for the course, please email command27@ymail.com. A conservation number is now required for this course. If you have not already obtained a conservation number, please go to www.ct.wildlifelicense.com/InternetSales/Sales. This number is also issued for hunting or fishing

licenses. If you already have a conservation number, it can be used for this course signup. A press release on the Boating Safety Course will be sent to various newspapers and supplementals.

C) Water Quality Sampling:

- **In-House Reports:** Now that the signed contract has been submitted, Scott will begin sampling. We will confirm October 8 with Dr. Kortmann to present the 2014-15 data. We will also check to see if Dr. Kortmann could attend the June meeting.
- **Outside Reports:** Mike will begin gathering weekly campground testing results from Uncas Health District.

Old Business

- **Gardner Lake Fire Department Hydrants:** No follow-up has been received.
- **Slow-No-Wake-Zone:** Mike has prepared the marker permit application. Kate Johnson made a motion to approve GLA support of the marker permit application, for up to two markers, between Minnie Island and Pequot Ledge Campground; seconded by Bob Neddo. Eight members voted in favor; Mike Magliano abstained. The motion passed. Upon approval by DEEP, Mike has offered to place the markers in the water.
- **GLA Email Address & Website:** Discussion continued about developing a website and the need for someone to keep a website current. GLA will check with Salem First Selectman Kevin Lyden's office about any recommendations they may have. The goal would be to allow citizens public access to GLA agendas, minutes and lake study information.

New Business

None.

Public Comment

- **Trout Stocking:** Bill Schultz reported on one trout stocking when the State had to cut a hole in the ice and stocked 5,000 trout.

Next Meeting Date

The next meeting will be held on Thursday, June 11, 2015 at the Bozrah Senior Center at 7:00 pm.

Adjournment

Larry Harrington made a motion to adjourn at 8:12 p.m.; seconded by Mike Magliano. The motion passed unanimously.

Respectfully submitted,



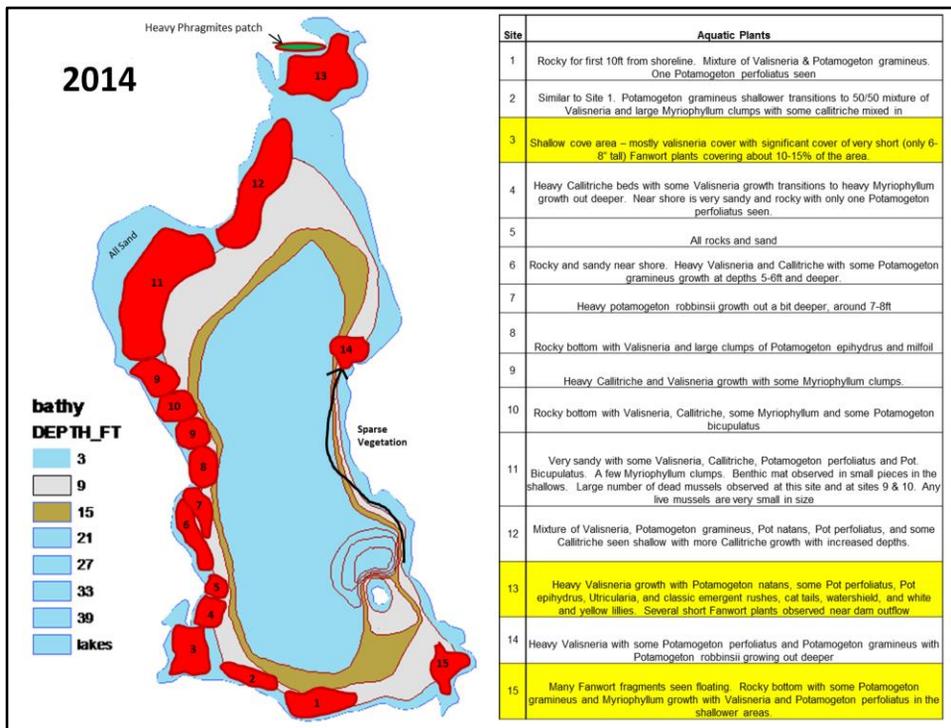
Kate Johnson,
Secretary



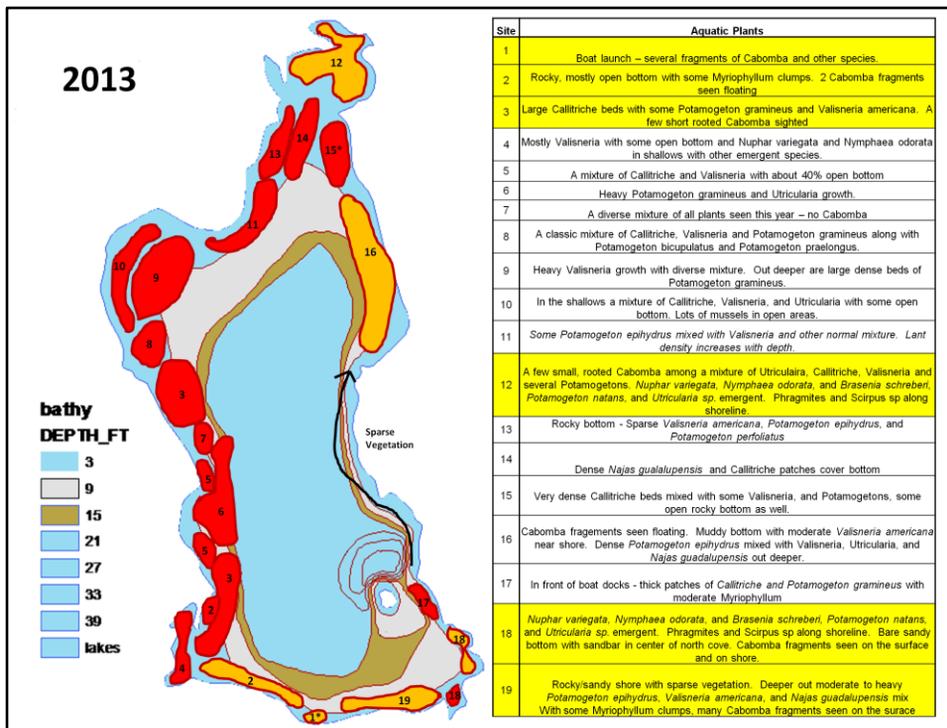
Gardner Lake ***2014***

Prepared for the Gardner Lake Authority
Prepared by Robert (Bob) Kortmann, Ph.D.
Ecosystem Consulting Service, Inc.





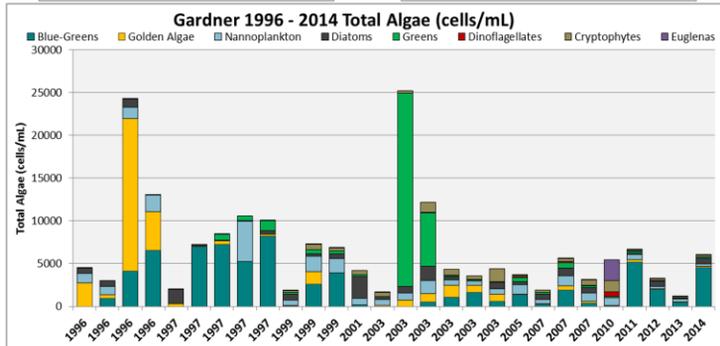
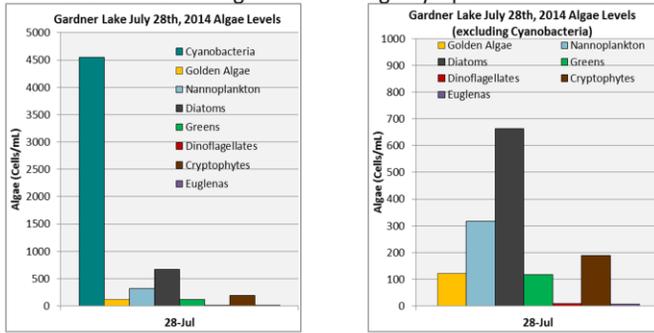
The annual Gardner Lake shoreline macrophyte survey was completed on July 31st, 2014. Weather conditions were good in the morning with mostly sunny skies and light wind. As the day progressed, however, wind speeds increased significantly to 10-15mph, with gusts to 25mph. By midafternoon, the waves generated by the wind and moderately heavy boat traffic made it too dangerous to do any extensive surveys on the eastern shore, but stops were made in any protected cove areas where waves were not as high. Also, the entire western shore was observed with no difficulty because the wind direction was favorable. Overall, 2014 aquatic macrophyte growth patterns were similar to those seen in the past with a dense and diverse population of native species as well as a few non-native species. The majority of the perimeter of Gardner Lake is either very rocky or sandy with very limited plant growth from shore out to 4ft or so, with the exception of the shallow cove areas. Macrophyte communities were characterized by *Valisneria americana* (Tapegrass) and *Potamogeton gramineus* (pondweed sp.) in shallow areas, but transitioned to varying mixtures of *Myriophyllum* sp., *Callitriche*, and *Potamogeton robbinsii* with increased depth. Other *Potamogeton* species were observed at lower frequency including *Potamogeton perfoliatus*, *P. bicupulatus*, and *P. natans*. In the protected cove areas with undisturbed shoreline at the north, southwest, and southeast corners of the lake, classic emergent macrophyte species were observed including *Brasenia schreberi* (Watershield), *Decodon verticillatus*, *Nuphar variegata* (Yellow Water-lilly), *Nymphaea odorata* (White Water-lilly), *Typha* sp.(Cattails), along with various rushes and grasses, including large stands of *Phragmites australis*. This could become a concern because this species of grass has been known to overtake shoreline areas, and is difficult to remove.



The primary species of concern, *Cabomba caroliniana* (Fanwort), was observed at several locations in both fragments and rooted form. Rooted specimens were seen in the north cove near the spillway and in the shallow cove area in the southwest corner of the lake. The southwest cove had the heaviest Fanwort growth, with Fanwort comprising approximately 10% of the macrophyte community. In both the southwest and northern coves, any fanwort individuals were surrounded by dense growth of native species. All rooted Fanwort plants were only a few inches in height, but it is important to note that they were not observed in these areas in 2013. This suggests that they could be the result of fragments that had washed into the areas and rooted. Other than the short specimens observed in these two shallow cove areas, no other rooted Fanwort was seen.

Although more rooted Fanwort individuals were observed this year than in the past several years, they were small, sparsely distributed, and found in shallow water within winter-drawdown range. It is important to continue to monitor for, and prevent, any events that could upset the currently healthy ecological balance of Gardner Lake. Events such as increased nutrient loads, or a heavy turbidity episode could provide beneficial growing conditions for non-native and nuisance species, which could then outcompete the native species and take over the lake. Reduced light penetration as a result of nutrient loads or a turbidity episode could result in a “Switching of Primary Productivity State” from rooted vegetation to photosynthetic bacteria, the Cyanobacteria (as happened at several area lakes over the past several decades).

2014 ECS Limnological Monitoring Phytoplankton Results



Although cell densities have not exhibited a “bloom condition”, the Cyanobacteria have been the dominant phytoplanktonic primary producers.

2014 ECS Limnological Monitoring Profile Results

FIELD DATA SHEET

Personel: Anne Ewert
 Lake: Gardner Lake
 Station: Deep Hole
 Stage: Full
 Date: 7/28/2014
 Time: 11:30AM



- Strong stratification between 7 and 8m
- Temperature drops from 25-17degrees C
- Oxygen drops drastically from 5.8mg/L to below 0.5mg/L
- CO2 increases almost tenfold over bottom
- Specific Conductivity increases
- ORP becomes strongly negative with depth
- Layers of turbidity at thermocline and above the sediment

Weather: Mostly Cloudy, warm, windy

Anoxia: 6.8 m
 SumRTRM: 305
 Secchi Depth: 2.9 m

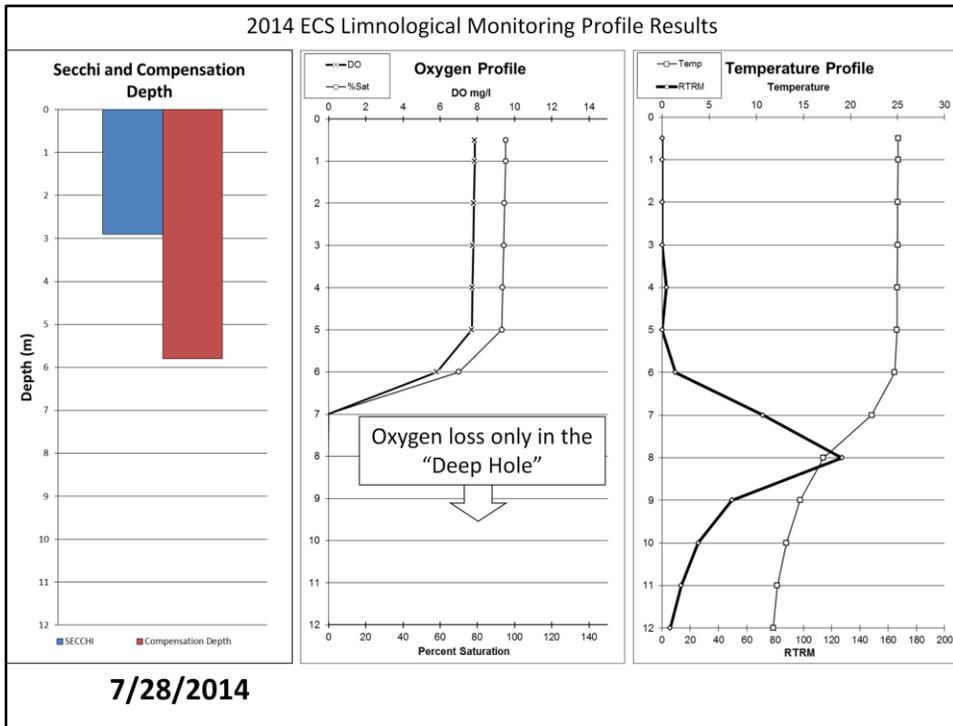
Algae Tow Length: 5 m
 Zoop Tow Length: 11.7 m

Compensation Depth: 5.8 m

Depth	Temp (°C)	DO mg/L	DO %	RTRM	pH	SpCond	ORP	Turbidity	CO2 mg/L
0.5	25.07	7.87	96.9	0	7.19	105.0	151	1.1	
1	25.07	7.87	97.0	0	7.19	104.9	153	1.3	3.75
2	25.02	7.82	96.3	0	7.18	104.9	156	1.5	
3	25.01	7.78	95.8	0	7.18	104.9	153	1.3	
4	24.97	7.74	95.9	3	7.17	104.9	156	1.6	
5	24.93	7.71	95.5	0	7.12	104.8	158	1.5	
6	24.69	5.83	72.0	9	6.81	105.2	164	1.4	3.75
7	22.27	-0.01	-0.1	71	6.57	116.9	3	8.5	
8	17.13	-0.04	-0.4	127	6.76	127.3	47	2.6	
9	14.65	-0.06	-0.6	49	6.74	124.6	-115	1.3	
10	13.19	-0.08	-0.8	25	6.92	132.1	-134	1.2	
11	12.22	-0.09	-0.9	14	7.04	146.9	-142	4.3	
12	11.80	-0.10	-1.0	6	7.23	165.1	-154	5.0	30

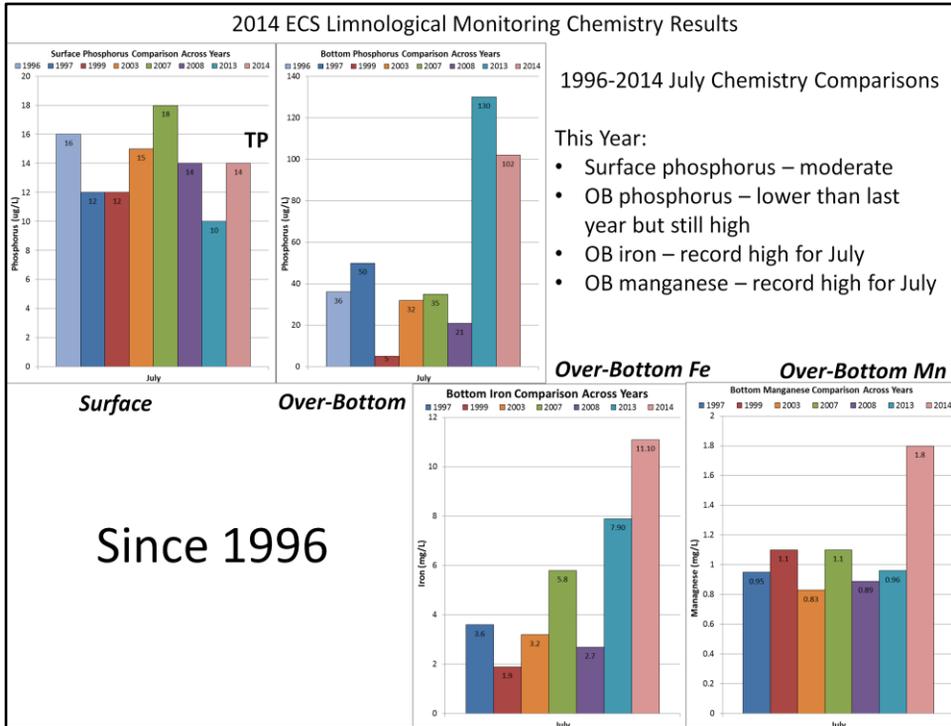
Notes: OB sample dark grey in color and very turbid
Heavy Thunderstorms passed through in the early AM

Light penetration, hence aerobic conditions, extended to 6m in 2014. That covers most of the lake bottom. The deep hole exhibits anoxic conditions to the top of the hole, resulting in high over-bottom nutrients and anaerobic respiration products.



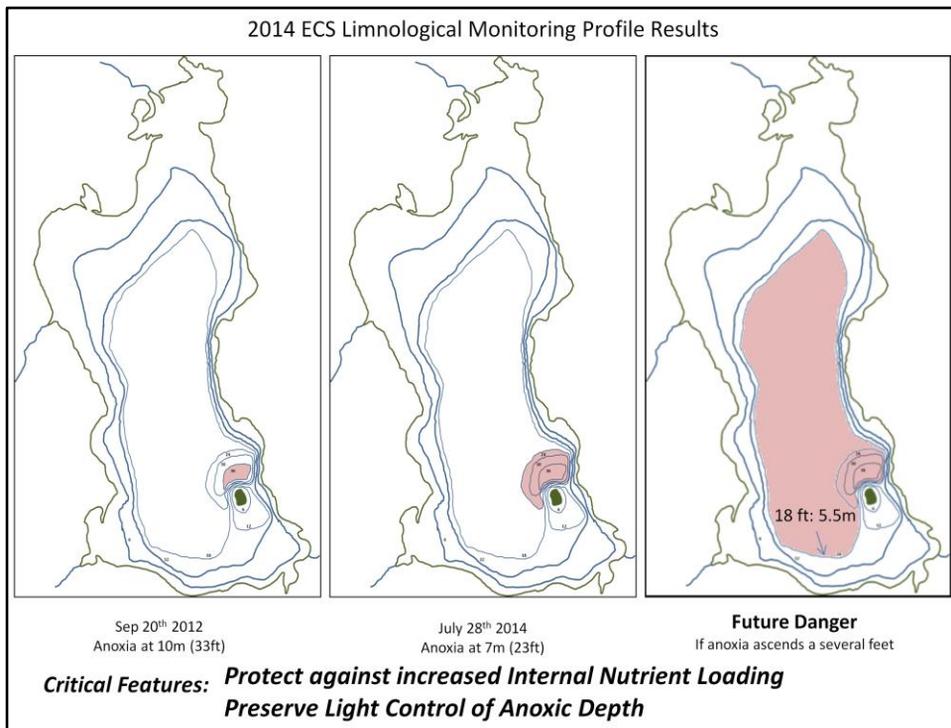
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2014 ECS Limnological Monitoring Chemistry Results



Light penetration, hence aerobic conditions, extended to 6m in 2014. That covers most of the lake bottom. The deep hole exhibits anoxic conditions to the top of the hole, resulting in high over-bottom nutrients and anaerobic respiration products.

An examination of past years suggests that conditions below 6m in the deep hole are intensifying. Oxygen loss is now reaching the top of the deep hole.



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It is very important to maintain light penetration to 5-6m (2x Secchi Depth) during summer stratification, and aerobic over-bottom conditions to the top of the deep hole. If a turbidity episode were to occur, reducing light penetration and resulting in further upward ascent of the anoxic boundary, Cyanobacteria blooms would be stimulated by internal events.

2014 ECS & Client Co-Op Monitoring Profile Data

Temperature (°C)		> 25 °			
Depth (m)	28-Apr	28-May	29-Jun	28-Jul	25-Aug
0.5	12.6	18.7	25.8	25.1	25.5
1	12.6	18.7	25.8	25.1	25.2
2	12.5	18.8	25.2	25.0	24.5
3	12.2	18.8	24.8	25.0	24.1
4	11.8	18.8	24.0	25.0	23.5
5	11.7	18.8	22.9	24.9	23.3
6	11.6	18.5	21.7	24.7	23.2
7	11.5	18.4	18.9	22.3	23.1
8	11.5	16.2	16.8	17.1	22.8
9	11.5	13.3	15.2	14.7	17.7
10	11.4	12.5	12.9	13.2	13.9
11				12.2	
12				11.8	

RTRM		> 20	>50	SUM>100		
Depth (m)	28-Apr	28-May	29-Jun	28-Jul	25-Aug	
0.5	0.0	0.0	0.0	0.0	0.0	0.0
1	0.0	0.0	0.0	0.0	0.0	9.7
2	1.5	-2.3	19.3	0.0		22.0
3	4.5	0.0	12.7	0.0		12.4
4	5.6	0.0	24.9	3.1		18.0
5	1.3	0.0	32.7	0.0		6.0
6	1.3	7.0	34.0	9.3		3.0
7	1.3	2.3	72.4	71.4		3.0
8	0.0	48.1	47.4	127.3		8.7
9	0.0	52.8	32.0	49.4		131.2
10	1.3	12.4	39.6	25.5		75.0
11						13.6
12						5.6
SUM	17	120	315	305		289
MAX	6	53	72	127		131

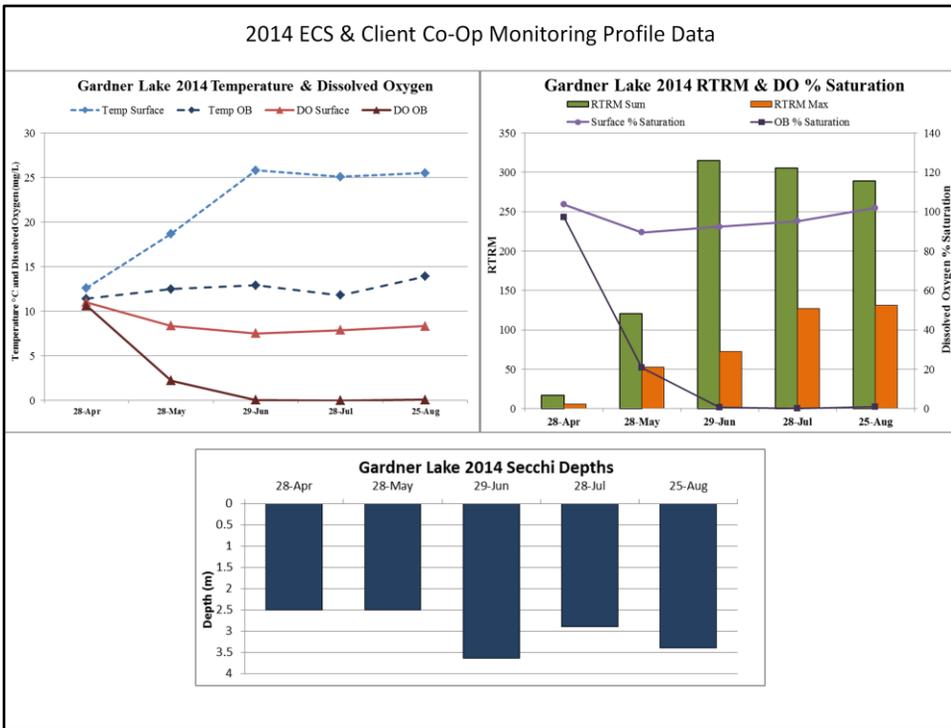
% Saturation DO		> 100%			
Depth (m)	28-Apr	28-May	29-Jun	28-Jul	25-Aug
0.5	103.6	89.5	92.3	95.2	101.9
1	103.6	90.5	90.6	95.2	100.4
2	103.0	89.4	92.6	94.6	99.2
3	102.7	89.5	88.9	94.2	98.2
4	100.7	117.0	81.5	93.5	93.6
5	101.8	88.5	57.2	93.1	90.9
6	99.9	87.9	26.8	70.0	80.2
7	98.1	81.8	1.1	-0.1	74.0
8	99.7	44.6	0.7	-0.4	57.4
9	98.3	32.1	0.6	-0.6	0.9
10	97.3	20.9	0.6	-0.8	0.8
11				-0.8	
12				-0.9	

Dissolved Oxygen (mg/L)		< 1mg/L < 0.5 mg/L			
Depth (m)	28-Apr	28-May	29-Jun	28-Jul	25-Aug
0.5	11.0	8.4	7.5	7.9	8.3
1	11.0	8.5	7.4	7.9	8.3
2	11.0	8.3	7.6	7.8	8.3
3	11.0	8.3	7.4	7.8	8.3
4	10.9	10.9	6.9	7.7	8.0
5	11.1	8.2	4.9	7.7	7.8
6	10.9	8.2	2.4	5.8	6.9
7	10.7	7.7	0.1	0.0	6.3
8	10.9	4.4	0.1	0.0	4.9
9	10.7	3.4	0.1	-0.1	0.1
10	10.6	2.2	0.1	-0.1	0.1
11				-0.1	
12				-0.1	

Secchi						
Date	28-Apr	28-May	29-Jun	28-Jul	25-Aug	
Secchi (m)	2.5	2.5	3.65	2.9	3.4	
Cmp Dpth (m)	5	5	7.3	5.8	6.8	
Bottom (m)	10	10	10	12	10	

The Coop Client Monitoring program provides very good data for tracking water quality conditions and forecasting future conditions, cost-effectively.

2014 ECS & Client Co-Op Monitoring Profile Data



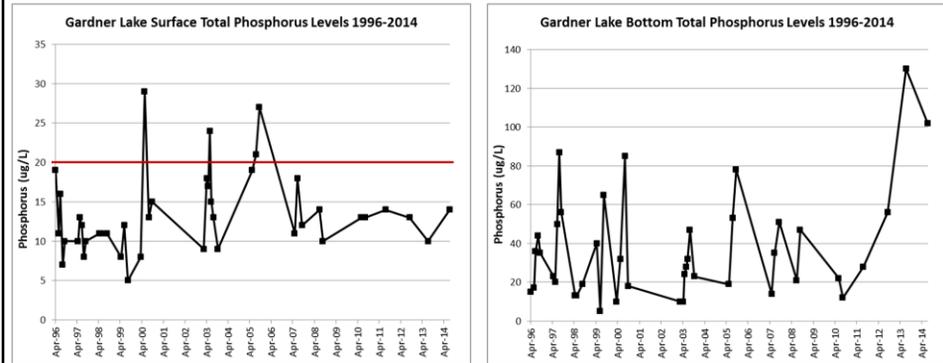
The Coop Client Monitoring program provides very good data for tracking water quality conditions and forecasting future conditions, cost-effectively. It is very important to monitor in-lake conditions. If the lake begins to exhibit a “switch” to phytoplanktonic blooms of photosynthetic bacteria quick remedial response would be prudent. The sampling frequency is fine, perhaps increase the Secchi disk readings to weekly.

2014 ECS Limnological Monitoring Chemistry Results

July 28, 2014

	Total Phosphorus (ug/L)	Ammonia (ug/L)	Nitrate (ug/L)	Iron (mg/L)	Manganese (mg/L)	Silica (mg/L)
1m	14	21	<10			1.35
Mid - 7m	17	27	<10	0.24	0.03	
OB - 12.1m	102	1170	<10	11.1	1.8	

- Over bottom Phosphorus concentration high level during 2014.
- Presence of Silica good for Diatom growth
- Higher Iron and Manganese



Surface waters continue to be below 20 ppb Total Phosphorus. However, TP in the deep hole appears to be increasing in recent years.

2014 Client Co-Op Chemistry Results

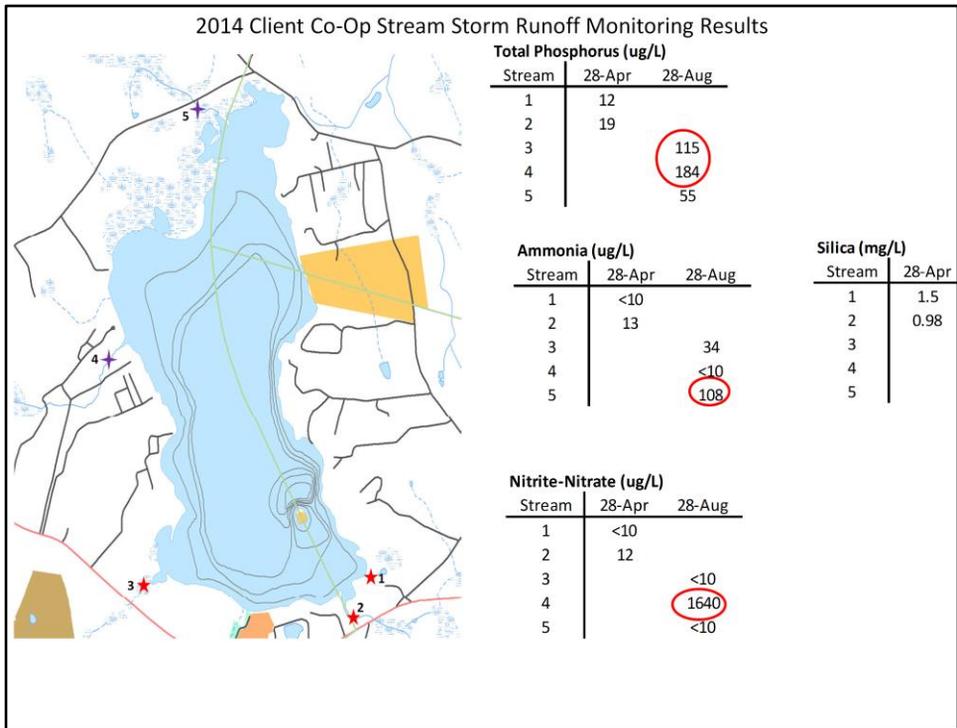
Total Phosphorus (ug/L)						Iron (mg/L)					
	28-Apr	28-May	29-Jun	28-Aug	28-Sep		28-Apr	28-May	29-Jun	28-Aug	28-Sep
1m	10	11	7	12	6	OB 10m	0.08	0.33	2.2	8.7	0.82
Mid 5m	10	11	10	13	12						
OB 10m	8	15	19	44	20						

Ammonia (ug/L)						Manganese (mg/L)					
	28-Apr	28-May	29-Jun	28-Aug	28-Sep		28-Apr	28-May	29-Jun	28-Aug	28-Sep
1m	28	<10	10	<10	<10	OB 10m	0.031	0.21	0.87	1.8	0.18
Mid 5m	27	<10	30	<10	<10						
OB 10m	24	166	355	870	68						

Nitrite-Nitrate (ug/L)						Silica (mg/L)					
	28-Apr	28-May	29-Jun	28-Aug	28-Sep		28-Apr	28-May	29-Jun	28-Aug	28-Sep
1m	<10	<10	<10	<10	<10	1m	1.6	0.36	0.73	1.9	2.2
Mid 5m	<10	<10	<10	<10	<10	OB 10m	1.65	2.7	3.1	5	
OB 10m	<10	24	<10	<10	<10						

Client Co-Op samples taken at a 10m location off the NW corner of Minnie Island, close to the ECS Deep Hole sampling site.

The Coop Program analyses reveal high concentrations of TP, Ammonia-N, Iron, and Manganese in deep water of the “hole”.



Coop samples revealed high TP and Nitrate at Streams 3 and 4.