

2013		TABLE 1		See blue below!			DEEP-WATER MONITORING WEST			See Table 3		PAGE 1		
WEST BASIN:		City G.L. at DAM outlet						WEST CUSTER COLOR			PUBLIC (1-5)		TEMPERATURES (F)	
DAY/DATE	TIMES	SECCHI (FT)	LAKE LEVEL (FT)	COLOR (EYE)	DEEP-WATER	1/2 SECCHI	1/2 M (2 FT)	PERCEPTION	AIR (F)	LAKE SURFACE				
Tue June 11	12:00	15.0	796.5	Green	Murky	3	1.5	NR	74	68				
Mon June 17	10:00	19.0	796.6	Green	Clear	4	1.5	NR	78	68				
Wed June 19	10:25	20.5	796.6	Green	Clear	3	1.5	1	72	68				
Thur June 27	1:30	20.0	796.7	Green	Clear	4	1.5	2	80	72				
Sun July 7	11:45	24.5	796.6	Green-Brown	Murky	4	2.0	3	86	75				
Thur July 11	1:20	29.0	796.7	Green	Clear	4	1.5	3	84	77				
Sun July 20	1:10	15.5	796.5	Green-Brown	Murky	4	2.0	4	92	82				
Wed July 31	10:35	16.0	796.4	Green	Murky	4	2.0	4	76	73				
Sat Aug 3	10:35	19.0	796.5	Green	Murky	NR	NR	NR	74	74				
Thur Aug 8	1:20	16.0	796.5	Green	Murky	3	1.5	4	74	73				
Wed Aug 14	10:50	18.0	796.4	Green-Brown	Murky	4	2.0	4	71	73				
Sat Aug 17	1:17	15.5	796.4	Green	Murky	4	1.3	3	89	78				
Sat Aug 31	10:55	10.5	796.3	Brown	Murky	4	2.0	4	75	76				
Fri Sept 6	1:20	12.5	796.3	Green	Murky	4	2.0	4	80	75				
Sun Sept 22	1:30	16.5	796.2	Green	Murky	4	2.0	3	64	68				
Wed Oct 2	10:30	20.5	796.2	Green-Brown	Murky	4	1.5	2	64	66				
Thur Oct 10	11:05	19.5	796.1	Green-Brown	Murky	4	2.0	2	74	64				
<b>AVERAGES</b>		<b>18.1</b>							<b>77</b>	<b>72</b>				
2013		TABLE 2		DEEP-WATER MONITORING EAST			See Table 3							
EAST BASIN		At Monitor'g Dates						EAST CUSTER COLOR			PUBLIC (1-5)		TEMPERATURES (F)	
DAY/DATE	TIMES	SECCHI (FT)	GLSD RAINFALL (IN.)	COLOR (EYE)	DEEP-WATER	1/2 SECCHI	1/2 M (2 FT)	PERCEPTION	AIR (F)	LAKE SURFACE				
Tue June 11	12:30	10.5	0.9	Green	Murky	3	2.0	NR	74	68				
Mon June 17	10:15	35.0		Green	Clear	4	1.5	NR	78	68				
Wed June 19	11:35	34.0		Green	Clear	4	1.0	1	72	67				
Thur June 27	1:50	35.0	4.6	Green	Clear	4	1.5	2	85	76				
Sun July 7	12:10	20.0		Green-Brown	Murky	4	2.0	3	84	86				
Thur July 11	2:00	16.5		Green	Murky	4	2.0	3	84	80				
Sun July 20	2:00	16.0		Green-Brown	Murky	4	2.0	4	92	84				
Wed July 31	11:15	16.0	3.4	Green-Brown	Murky	4	2.0	4	80	75				
Sat Aug 3	11:15	18.0		Green	Murky	NR	NR	NR	74	74				
Thur Aug 8	1:52	16.0		Green	Murky	4	1.5	4	76	74				
Wed Aug 14	11:20	12.0		Green-Brown	Murky	4	2.0	4	73	75				
Sat Aug 17	1:58	13.0		Green	Murky	3	2.0	3	90	86				
Sat Aug 31	11:30	5.5	1.1	Green	Murky	4	2.0	4	78	77				
Fri Sept 6	2:00	12.5		Green	Murky	4	1.5	4	82	78				
Sun Sept 22	2:25	16.5	2.7	Green	Murky	4	2.0	3	66	69				
Thur Oct 2	11:15	20.0		Green-Brown	Murky	4	2.0	2	68	69				
Thur Oct 10	12:00	16.0	0.4	Green-Brown	Murky	4	2.5	2	74	64				
<b>AVERAGES</b>		<b>18.4</b>	<b>13.1</b>						<b>78</b>	<b>75</b>				
			<b>Above: Rainfall Total "</b>											
Green Lake County, Green Lake, WI. USA.						USGS closed station at Highway A, Silver Creek Inlet 7/27/ Data included 24 Water Years: Sep 30, 1988 to Oct 1, 2011								
Winter before 2013 summer records: Ice on lake = 85 days.						New Highway K station at west inlet opened 10/29/12.								
Freeze date = 1/24/13; Thaw date = 04/19/13.						(Note: Hwy A manual until 1997 when changed to automat								
(These ice data are available from 1939 at Green Lake Sanitary District)														
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NOTE: ON SEPT 5, 2013 TED M. JOHNSON & 2 DNR STAFF DID 3 SCUBA DIVES IN GREEN LAKE; A SUMMARY WAS EMAILED ON SEPT 12.														

INFORMATION AND COMMENTS ON MONITORING BOTH EAST & WEST DEEP-WATER STATIONS, GREEN LAKE, GREEN LAKE COUNTY, WI.			
2013 DATES	Days usually were suitable for monitoring; sometimes plankton tow may not be exactly vertical due to wind.		
Tue June 11	Lake surface scummy with insects and seeds from land plants. VERY abundant zooplankton: Cyclopoids (eggs), Daphnidia (large embryos - esp. in East ) & nauplii. Observed no Blue-greens (BG), abundant <i>Tabellaria</i> , <i>Keratella</i> spp., conifer pollen & some oak leaf stellate hairs. <i>Spirogyra</i> conjugating.		
Mon June 17	East Secchi shockingly clearer than clear West. Littoral areas north shore showing mainly Eurasian milfoil. Observed no BG's. Attached filamentous algal spp include <i>Spirogyra</i> (conjugating), <i>Zygnema</i> , <i>Rhizoclonium</i> & <i>Cladophora</i> . Many floating mats of macrophytes. <i>Lemna</i> (duckweed) floating at east end of lake.		
Wed June 19	Some ephippia (resting stage) of <i>Daphnia</i> present along with abundant zooplankton; first BG appearing (infrequently) is <i>Coelastrum</i> & about 5 Green algal spp. Microscope shows abundant <i>Ceratium</i> , <i>Fragilaria</i> , <i>Sphaerocystis</i> , <i>Spirogyra</i> , <i>Staurastrum</i> & <i>Tabellaria</i> . Unusual to see flowers/seeds of Eurasian milfoil.		
	<i>Ranunculus</i> (Buttercup) & <i>Potamogeton pectinatus</i> (Sago Pondweed) blooming now, too. Variety of visible plankton suspended just below surface like "tapioca".		
Thur June 27	MANY macrophytes visible at surface with attached filamentous algal spp. & many mats of floating weeds! Algae: 5 BG spp. & 6 Green spp. Very abundant zooplankton ( <i>Cyclops</i> , <i>Daphnia</i> & nauplii), <i>Keratella cochlearis</i> , <i>K. quadrata</i> plus <i>Ceratium</i> , <i>Fragillaria</i> , <i>Staurastrum</i> & <i>Tabellaria</i> very evident.		
Sun July 7	Microscope shows first zebra mussel veligers (ZMs) I observed. Weeds are exceedingly dense around pier areas and far out. Many floating mats. Flying hatches of insects, grasshoppers, fireflies, damsel- and dragonflies. Gulls! Previous listed blooming macrophytes plus white water lilies in flower. Abundant plankton (= "tapioca" below lake surface). BG algae: <i>Anabaena</i> , <i>Gleocapsa</i> , <i>Gleotrichia</i> , <i>Gomposphaeria</i> , <i>Microcystis</i> & <i>Lyngbya</i> . At least 12 spp. Green algae.		
Thur July 11	Filamentous <i>Rhizoclonium</i> forms especially large clumps and thick webs on submersed aquatic plants; other filamentous algae are <i>Zygnema</i> , <i>Spirogyra</i> & <i>Mougeotia</i> . Floating & growing aquatic plants with attached filamentous algae are a serious nuisance in lake. ZM's veligers abundant.		
Sun July 20	Lake continues to be murky & green/brown in color and both water and air are very warm! Aquatic plants growing and floating are serious problems for use of lake and plankton organisms suspended down from surface like "tapioca". BG = 8 spp with <i>Anabaena</i> & <i>Microcystis</i> most imp. Most abundant: <i>Ceratium</i> & <i>Staurastrum</i> .		
Wed July 31	Surface covered with foam, floating weeds, molted gull feathers, and light bloom of <i>Anabaena</i> , <i>Microcystis</i> & especially in east, <i>Gleotrichia</i> . Aquatic plants growing thickly between and far out from piers covered with abundant attached filamentous algal spp: <i>Zygnema</i> , <i>Mougeotia</i> , <i>Spirogyra</i> &, especially, <i>Rhizoclonium</i> .		
Sat Aug 3	No plankton tow or Custer colors. Note change in Dissolve Oxygen (DO) both % and mg/l at 10 M. <i>Vallisneria</i> plants (wild celery) are growing toward surface.		
Thur Aug 8	<u>Lake residents are unhappy with quantity of weeds and the effort of harvester. Evident little effort to remove cut weeds after a sharp tool pulled along bottom cutting off weeds. Also several folks exploring use of chemicals to add off piers because of such dense growth of weeds and filamentous algae! Minnows West sur</u>		
	<u>Harvesting the macrophytes &amp; filamentous algae is an important way to remove excess nutrients from Green Lake &amp; the DNR should allow cutting between piers.</u>		
Wed Aug 14	Fringe of filamentous alga sp. along north shore rocks is <i>Cladophora</i> ; See July 31 for listed filam. algal spp. VERY evident on weeds - terrible nuisance! Floating n probably from the tool for cutting weeds along the bottom to clear piers for use. Harvester should be almost filled when truly harvesting around a few piers when thorough job accomplished! Many kinds of plankton in tow. Unidentified minnows near surface East deep water.		
Sat Aug 17	Fishermen are reporting minnows all over lake; identification sought. Historically, emerald green shiners abundant here until all gone by 1964 (= Mike Norton). Flowers evident on wild celery, as well as on both long-leaf & clasping-leaf pondweeds. Eurasian milfoil underneath abundant filamentous algae! Monarch butterf		
Sat Aug 31	The 17 ft. (=5 M) plankton tow revealed unusually few <i>Daphnia</i> & <i>Cyclops</i> ; also very few ZMv's present now. Empty cells in algal filaments. Large masses of floating weeds & unknown MINNOWS near surface in deep-water. East secchi is unusually poor; the lake must have been stirred up as OK next r		
Fri Sept 6	Minnows identified: MIMIC SHINERS by Steven J. Fajfar, DNR & UW-Madison-Sea Grant. Many BG's (11 spp.) and Greens (8 spp.). No <i>Daphnia</i> in 17 ' tow = very very unusual. Coots returning.		
Sun Sept 22	<i>Cyclops</i> , <i>Daphnia</i> , <i>nauplii</i> , ZMv's & very small <i>Bosmina</i> are unusually infrequent. Abundant plankton and several unknowns. Wild celery very abundant along with other aquatics growing on bottom and floating. Eurasian milfoil looks frail with skimpy leaves on long stems and unusual blooming near City dam. Lake level		
Wed Oct 2	Shallow lake is very clear & filamentous algae are mainly gone. Bottom finally showing clearly dead and live ZM shells, rocks, pebbles & sandy areas. Floating gull dead insects & mats of weeds; shallow floating mats show bubbles of decay around them. Water stargrass macrophytes (sterile or hidden flowers) in small clump		
Thur Oct 10	Terrestrial leaves floating and/or sinking. MANY gulls around lake often sitting on canopys over boat lifts, on piers, on boats & lake releasing excrement. Floating many feathers, too. Large mats of floating wild celery. East surface water especially scummy & both stations showing plankton hovering several inches below sur Plankton are very abundant except <i>Daphnia</i> , <i>Nauplii</i> & <i>Cyclops</i> : hopefully they're lurking below 17 ft. tow.		
	<b>TABLE 3</b>		
	<b>DNR'S RANKED "PUBLIC PERCEPTION TABLE" (1 - 5)</b>		* ZM v's : microscopic view of Zebra Mussel (ZM) veligers identified as most like "15-day ZM veligers" based on colored photos from Ontario Ministry of Natural Resources.
	1. Beautiful, could not be nicer.		
	2. Very minor aesthetic problems, great for swimming/boating.		
	3. Swimming and aesthetic enjoyment slightly impaired (algae).		
12.	4. Desire to swim and lake enjoyment very much reduced (algae).		
	5. Swimming and aesthetic enjoyment nearly impossible (algae).		Monitoring by Mary Jane Bumby
	During 2013, problem "algae" above are mainly "macrophytes with attached filamentous algae".		Green Lake, Green Lake County, WI, USA
(c).	These plants are a terrible nuisance to the homeowners and show excess nutrients in Green Lake.		Report completed FEBRUARY 20, 2014
	Any blue-green algal bloom is very slight and only on very calm days.		
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Data are from HYDROLAB DS5 at East and West deep-water stations on the dates identified below and on next page. Red indicates low D

Note: Data are available for SPC, TDS, PCY, and CHL a (not accurate).

2013 WEST STATION																	
DEPTH	08-Jun	DO	pH	Turbid	####	DO	pH	Turbid	####	DO	pH	Turbid	11-Jul	DO	pH	Turbid	
(M)	TEMP C	% & mg/l		NTU	Temp C	% & mg/l		NTU	Temp C	% & mg/l		NTU	TEMP C	% & mg/l		NTU	
1 or 2	17.0	118 &	8.6	1.0	16.5	8 & 10.7	8.6	1.4	19.8	83.0 &	8.7	0.8	24.1	81.1 &	8.6	2.5	
5	14.7	116 &	8.6	1.0	14.7	5 & 9.4	8.5	1.9	19.2	81.0 &	8.7	1.0	23.7	82. &	8.6	2.7	
10	9.8	92. &	8.1	0.0	11.8	4 & 8.1	8.1	0.9	11.3	62.1 &	8.1	0.4	14.6	63 & 6	8.2	1.8	
12.5																	
15	7.5	93. &	7.9	1.0	7.1	4 & 9.4	7.8	0.0	7.7	63.1 &	7.9	0.0	7.8	59. &	7.8	0.9	
17.5																	
20	6.3	95. &	7.9	0.0	6.4	& 9.7	7.8	0.0	6.3	66.0 &	7.8	0.0	6.0	63. &	7.7	0.4	
25	5.4	97.5	7.9	0.0	5.7	& 10.1	7.8	0.0	5.7	67.7 &	8	7.8	0.0	5.4	63.5 &	7.7	0.3
2013 EAST STATION																	
DEPTH	08-Jun	DO	pH	Turbid	####	DO	pH	Turbid	####	DO	pH	Turbid	11-Jul	DO	pH	Turbid	
(M)	Temp C	% & mg/l		NTU	Temp C	% & mg/l		NTU	Temp C	% & mg/l		NTU	TEMP C	% & mg/l		NTU	
1 or 2	14.9	136.3 &	8.7	0.0	17.9	8 & 10.2	8.5	0.3	19.5	79.2 &	8.6	0.0	24.9	94. &	8.7	1.8	
5	14.3	129.7 &	8.6	0.0	15.6	1 & 10.3	8.5	0.8	17.9	76.0 &	8.5	0.0	24.4	108.4	8.7	2.6	
10	13	111.4 &	8.4	0.0	11.9	7 & 8.3	8.1	0.2	14.7	67.9 &	8.4	0.0	14.7	79.5 &	8.0	1.5	
12.5																	
15	7.4	95.5 &	8.0	0.0	6.9	7 & 9.3	7.8	0.0	6.2	63.0 &	7.8	0.0	9.4	102 &	7.7	0.5	
17.5																	
20	5.8	93.8 &	7.9	0.0	5.7	4 & 8.3	7.8	0.0	5.2	60.9 &	7.7	0.0	6.8	70. &	7.6	0.2	
25	5.2	93.0 &	7.8	0.0	Hit top of plants or bottom <25 m both days.								5.8	71. &	7.6	0.0	
2013 WEST STATION																	
DEPTH	09-Sep	DO	pH	Turbid	####	DO	pH	Turbid	####	DO	pH	Turbid	10-Oct	DO	pH	Turbid	
(M)	TEMP C	% & mg/l		NTU	Temp C	% & mg/l		NTU	Temp C	% & mg/l		NTU	TEMP C	% & mg/l		NTU	
1 or 2	23.8	74.1 &	8.4	3.6	20	62 & 5	7.3	0.7	18	67.4 &	7.7	0.6	17	61.4 &	7.8	0.6	
5	22.9	77.1 &	8.4	4.1	20	61.5 &	7.4	1.1	18	63. & 5	7.8	1.0	17	& 5.6	7.8	0.7	
10	15.3	58 &	6.9	2.9	20	60 & 5	7.5	1.1	18	63. & 5	7.8	1.2	17	& 5.6	7.8	0.4	
12.5	11.2	48. &	6.7	2.6					18		7.4	1.0					
15	9.4	49.4 &	6.6	2.3	8.7	41 & 4	6.2	0.3	10	38.4 &	7.3	0.6	10	34.7 &	6.8	0.2	
17.5	8.2	53.4 &	6.3	2.1					7.8	39.3 &	7.2	0.3	7	35.7 &	6.6	0.0	
20	7.4	54. &	6.2	1.8	6.4	43. & 5	6.8	0.0	6.3	41. & 4	7.3	0.1	6.5	40.5 &	6.7	0.0	
25	5.9	60.5 &	6.3	1.3	5.4	46.4 &	7.0	0.0	5.4	45. & 5	7.4	0.0	5.5	43.0 &	6.8	0.0	
2013 EAST STATION																	
DEPTH	09-Sep	DO	pH	Turbid	####	DO	pH	Turbid	####	DO	pH	Turbid	10-Oct	DO	pH	Turbid	
(M)	Temp C	% & mg/l		NTU	Temp C	% & mg/l		NTU	Temp C	% & mg/l		NTU	TEMP C	% & mg/l		NTU	
1 or 2					20	65.2 &	6.8	0.6	18	64.2 &	7.5	0.5	17	66.7 &	6.9	0.4	
5	NR	NR	NR	NR	20	66.2 &	7.0	1.1	18	59.3 &	7.5	0.8	17	61.6 &	7.3	1.1	
10					20	65.7 &	7.1	1.1	18	57.6 &	7.5	1.0	17	60.1 &	7.5	1.2	
12.5																	
15					10.6	40.9 &	6.4	0.7	8.1	38.4 &	7.5	1.3	9.8	37.5 &	7.4	0.7	
17.5									7.2	36.7 &	7.4	0.0	7.3	35.8 &	7.4	0.6	
20					7.3	42.2 &	6.9	0.3	6.6	37.8 &	7.4	0.0	6.3	36.9 &	7.4	0.1	
25					5.6	45.2 &	7.1	0.0	5.7	38. & 4	7.4	0.0	5.5	37.6 &	7.4	0.2	

