11/8/19

Greenwood Lake Harmful Algal Bloom
Sampling Results, Map and Flight Results

As of 11/7, all HAB advisories have been lifted for Greenwood Lake. Based on monitoring data collected on 11/4 and 11/6, the remaining localized HAB advisory at Awosting beach was lifted on 11/7.

If you see what appears to be a HAB, please "avoid it and report it."

- On 11/7, based on monitoring data, the advisory was lifted at Awosting Beach.
- On 10/29, based on monitoring data, the advisory was lifted in the Mid-late Central (GL002) portion of Greenwood Lake.
- On 10/24, based on monitoring data, the advisory was lifted for the Mid-lake South portion of the lake.
- On 10/22, based on monitoring data, the advisory was lifted at Brown's Point.
- On 10/10, based on monitoring data, the advisory was lifted at the Mid-lake North portion of the lake. As of that date, the advisory has been lifted for approximately 41% of the New Jersey portion of the lake.
- As of 10/8, based on monitoring data, the advisory was lifted at the Lakeside Community Club and Greenwood Lake Beach Association beaches.

Greenwood Lake Harmful Algal Bloom (HAB) Samples and Results as of 11/6/2019

Cell Counts (July-August)

		Cyanobacteria Counts cells/mL*												
		Date Sampled												
Site ID	Site name (all within NJ boundary)	7/10/2019	7/15/2019	7/22/2019	7/24/2019	7/29/2019	7/31/2019	8/5/2019	8/7/2019**	8/13/2019**	8/14/2019**	8/19/2019**	8/21/2019**	8/26/2019	8/28/2019
GL001	Mid-lake North	51000	61000	80160	100500	84700	134000	96500	> 57000	> 45000	> 55250	>69750	>115750	153000	108750
GL002	Mid-lake Center	---	90000	139250	111750	95500	58500	145000	> 34050	> 48250	> 48250	>45625	>65000	209750	135500
GL003	Mid-lake South	108000	212000	98560	133750	121250	472000	117500	> 101300	>91000	>84750	>54250	>93500	187250	127000
GL004	Browns Point	---	148000	232250	90625	152750	111250	90000	> 151750	>69500	> 58875	>76250	>73000	258250	202500
GL005	Lakeside Community Beach	---	---	71000	89875	82000	104000	85000	> 55250	>97750	>65000	>24750	>89625	148500	70000
GL006	Greenwood Lake Beach Assoc	---	---	33375	86750	30250	63000	56750	> 88250	>103375	>38500	>85500	>46750	165500	123250
GL007	Awosting Beach	---	---	156750	87500	77250	87750	128000	> 107750	>119750	>83750	>56750	>95875	133500	278500
GL008	Outlet	---	---	85375	94625	50250	58000	71000	> 31800	>38750	>37750	>21000	>49750	196750	132250

*NJ Health Advisory Guidance Levels
Cell Count ≥ 20,000 cells/ml;
Microcystins ≥ 3µg/L

Indicates > than advisory levels

**Cell counts greater than values shown due to the need for approximations for a newly observed cyanobacterial species

Cell Counts (September – November)

Site ID	Site name (all within NJ boundary)	Cyanobacteria Counts cells/mL*																	
		Date Sampled																	
		9/4/2019	9/9/2019	9/12/2019	9/16/2019	9/18/2019	9/23/2019	9/25/2019	9/30/2019	10/2/2019	10/7/2019	10/9/2019	10/16/2019	10/21/2019	10/23/2019	10/28/2019	10/30/2019	11/4/2019	11/6/2019
GL001	Mid-lake North	95875	76750	113500	50000	85500	62000	113250	57750	28625	17500	5500	---	---	---	---	---	---	---
GL002	Mid-lake Center	96000	73000	116500	22250	32250	58000	41750	46750	16500	40250	23875	44500	23500	16750	6750	---	---	---
GL003	Mid-lake South	144000	106250	89500	36250	47750	52875	90750	83750	34500	68000	67500	49000	14125	16375	---	---	---	---
GL004	Browns Point	138500	146500	71500	24250	57000	52375	39750	49750	33750	Present, below quantification	53000	13750	18500	---	---	---	---	---
GL005	Lakeside Community Beach	137250	76000	69000	72500	103250	90500	50125	62500	12250	13500	---	---	---	---	---	---	---	---
GL006	Greenwood Lake Beach Assoc	214250	83500	59750	66000	95500	50250	36875	23500	18000	8500	---	---	---	---	---	---	---	---
GL007	Awosting Beach	178250	111000	79750	44000	9000	53250	61750	31250	23250	30625	26750	31500	35750	24500	12500	64700	1000	Present, below quantification
GL008	Outlet	77750	72000	82250	38500	55000	64500	80500	45000	37000	14000	28500	20125	12250	14500	---	---	---	---

*NJ Health Advisory Guidance Levels
Cell Count ≥ 20,000 cells/ml;
Microcystins ≥ 3µg/L

Indicates > than advisory levels

**Cell counts greater than values shown due to the need for approximations for a newly observed cyanobacterial species

Toxins (July-August)

Site ID	Site name (all within NJ boundary)	Microcystins µg/l (lowest Reporting Level 0.15µg/l)*													
		Date Sampled													
		07/10/19	07/15/19	07/22/19	07/24/19	07/29/19	07/31/19	08/05/19	08/07/19	08/13/19	08/14/19	08/19/19	08/21/19	08/26/19	08/28/19
GL001	Mid-lake North	1.66	2.56	3.79	2.12	4.63	2.64	4.03	4.67	1.38	1.32	1.75	1.70	1.95	1.66
GL002	Mid-lake Center	3.01	3.27	4.77	1.43	5.64	2.44	3.37	5.71	1.04	1.02	2.05	1.86	2.71	2.54
GL003	Mid-lake South	4.45	3.02	4.54	1.65	6.21	2.91	3.67	6.11	0.98	1.19	2.43	2.66	2.27	2.65
GL004	Browns Point	---	4.50	3.40	2.13	5.66	2.76	3.50	6.18	0.98	0.80	2.38	1.60	2.25	3.12
GL005	Lakeside Community Beach	---	---	3.56	2.38	5.60	2.66	2.61	3.69	1.49	0.85	1.65	1.60	1.37	1.54
GL006	Greenwood Lake Beach Assoc	---	---	4.70	3.29	4.09	2.60	2.41	3.15	0.72	0.75	1.86	1.60	1.59	1.93
GL007	Awosting Beach	---	---	3.28	2.10	4.56	2.46	4.00	3.35	1.15	0.98	2.04	2.06	2.26	3.26
GL008	Outlet	---	---	3.74	2.51	4.84	1.53	2.88	3.35	1.79	0.94	1.76	1.81	2.84	2.70

*NJ Health Advisory Guidance Levels
Cell Count ≥ 20,000 cells/ml;
Microcystins ≥ 3µg/L

Indicates > than advisory levels

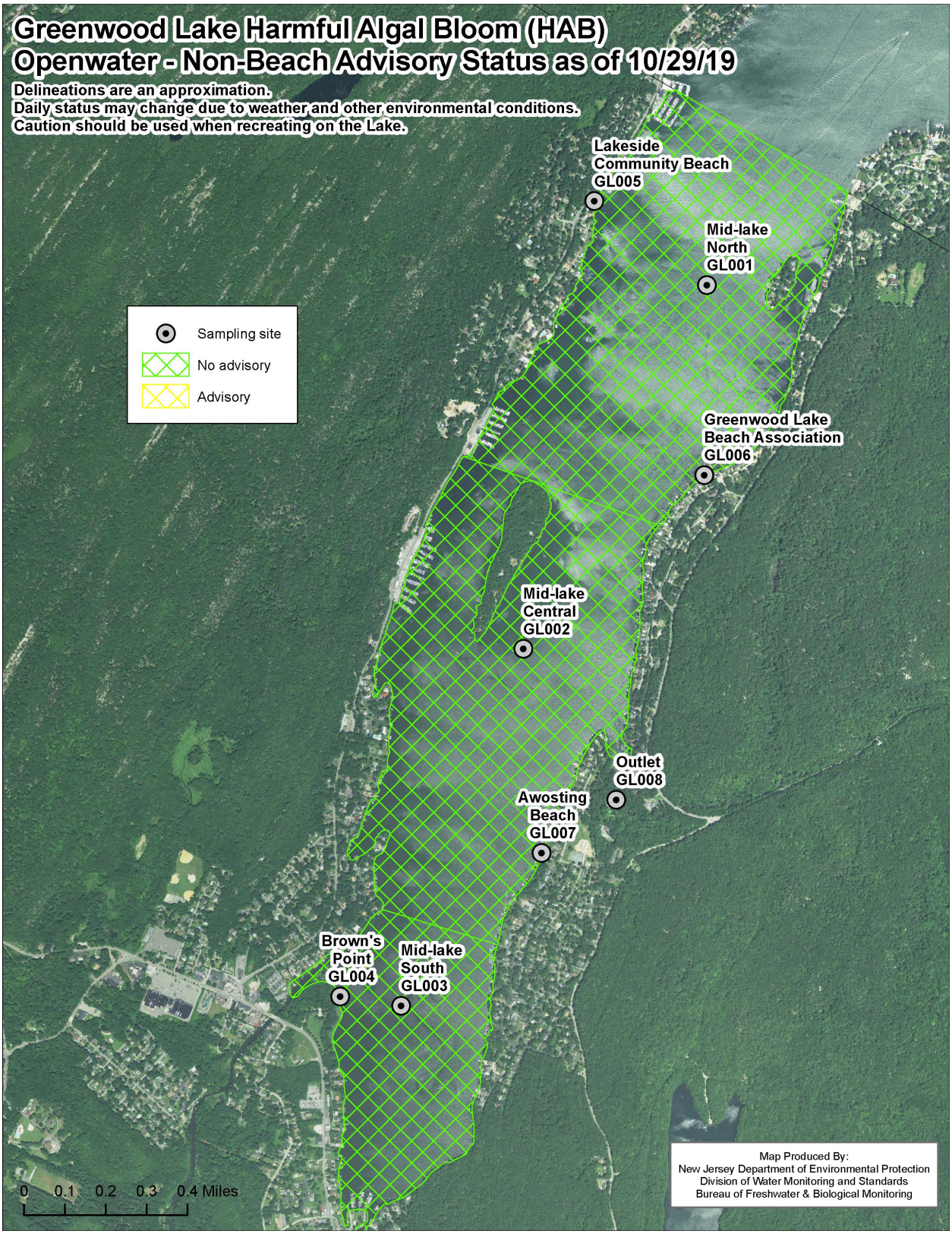
Toxins (September – November)

Site ID	Site name (all within NJ boundary)	Microcystins µg/l (lowest Reporting Level 0.15µg/l)*																	
		Date Sampled																	
		9/4/2019	9/9/2019	9/12/2019	9/16/2019	9/18/2019	9/23/2019	9/25/2019	9/30/2019	10/2/2019	10/7/2019	10/9/2019	10/16/2019	10/21/2019	10/23/2019	10/28/2019	10/30/2019	11/4/2019	11/6/2019
GL001	Mid-lake North	1.89	2.01	2.10	1.86	2.56	2.36	1.25	1.41	1.14	0.89	1.07	---	---	---	---	---	---	---
GL002	Mid-lake Center	3.42	2.21	2.11	2.50	1.80	1.23	2.01	1.00	0.84	0.63	1.09	0.69	1.03	0.44	0.39	---	---	---
GL003	Mid-lake South	3.50	2.37	3.29	1.90	2.90	1.21	0.95	1.15	1.01	1.89	1.17	1.05	0.44	2.13	---	---	---	---
GL004	Browns Point	2.29	2.41	1.97	1.28	1.24	1.56	1.07	1.74	4.04	0.27	1.02	1.06	0.59	---	---	---	---	---
GL005	Lakeside Community Beach	1.70	2.23	1.98	2.32	2.23	1.86	2.18	0.97	0.80	0.44	---	---	---	---	---	---	---	---
GL006	Greenwood Lake Beach Assoc	1.57	2.14	1.29	1.32	1.96	1.83	0.87	0.94	0.55	0.90	---	---	---	---	---	---	---	---
GL007	Awosting Beach	4.08	2.26	2.00	1.49	2.12	1.95	1.35	0.72	1.07	0.60	2.38	0.85	0.51	4.21	0.86	< Reporting Level	0.19	< Reporting Level
GL008	Outlet	3.06	2.23	2.79	1.73	2.14	1.04	1.04	0.83	0.72	0.78	1.64	1.47	0.54	0.59	---		---	---

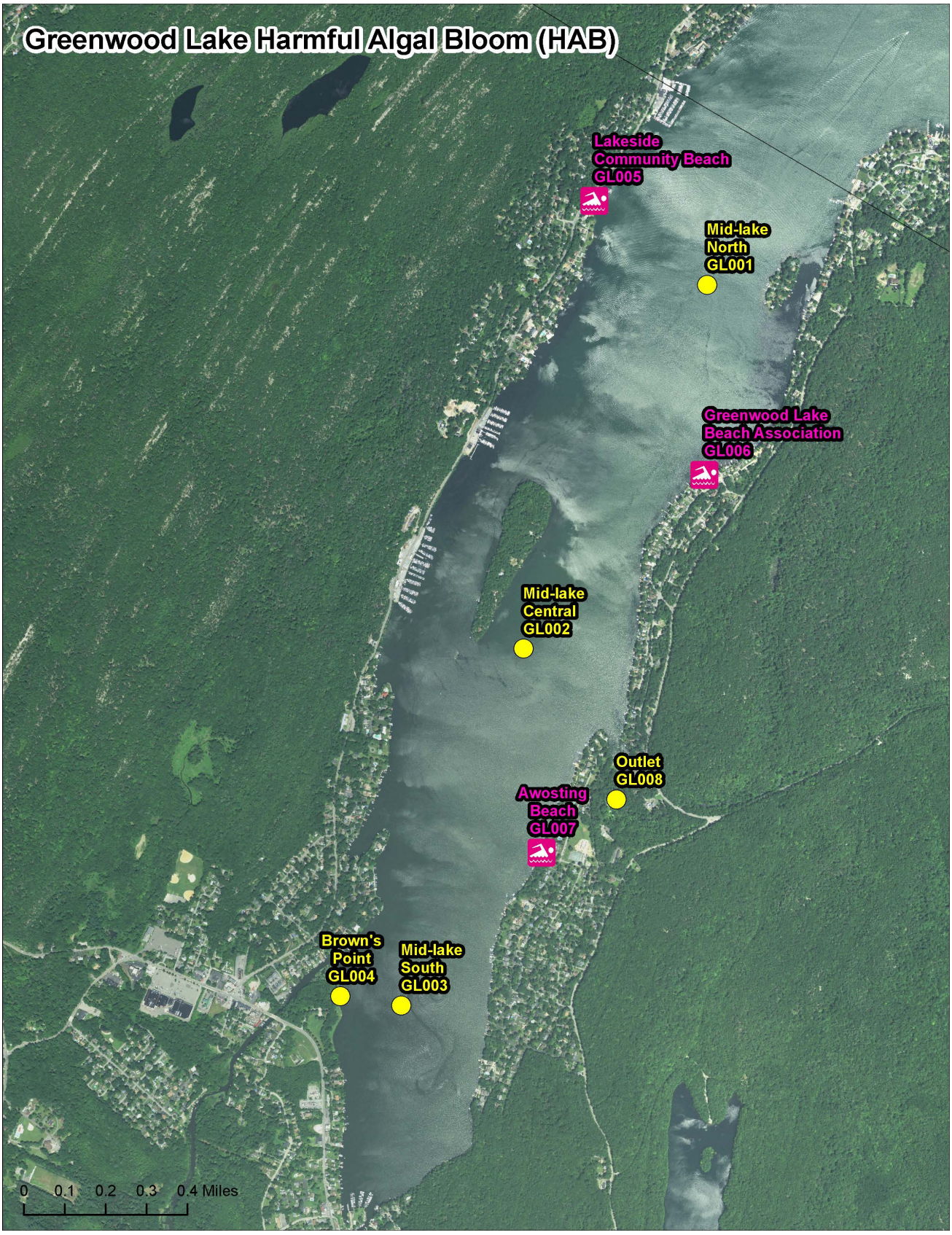
*NJ Health Advisory Guidance Levels
Cell Count ≥ 20,000 cells/ml;
Microcystins ≥ 3µg/L

Indicates > than advisory levels

Advisory Status

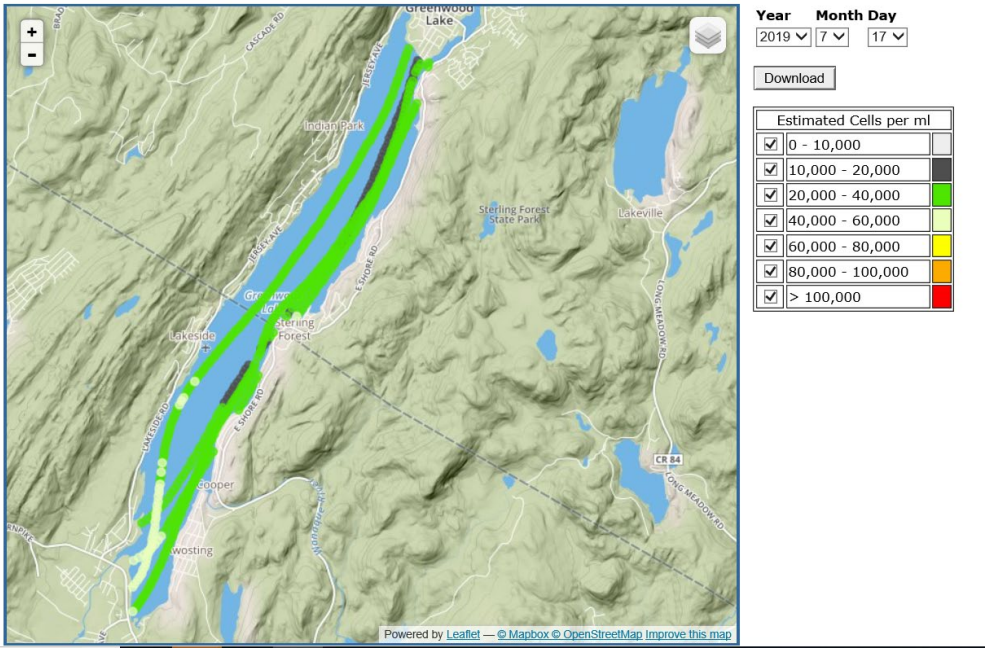


Sampling Locations and Beach Locations

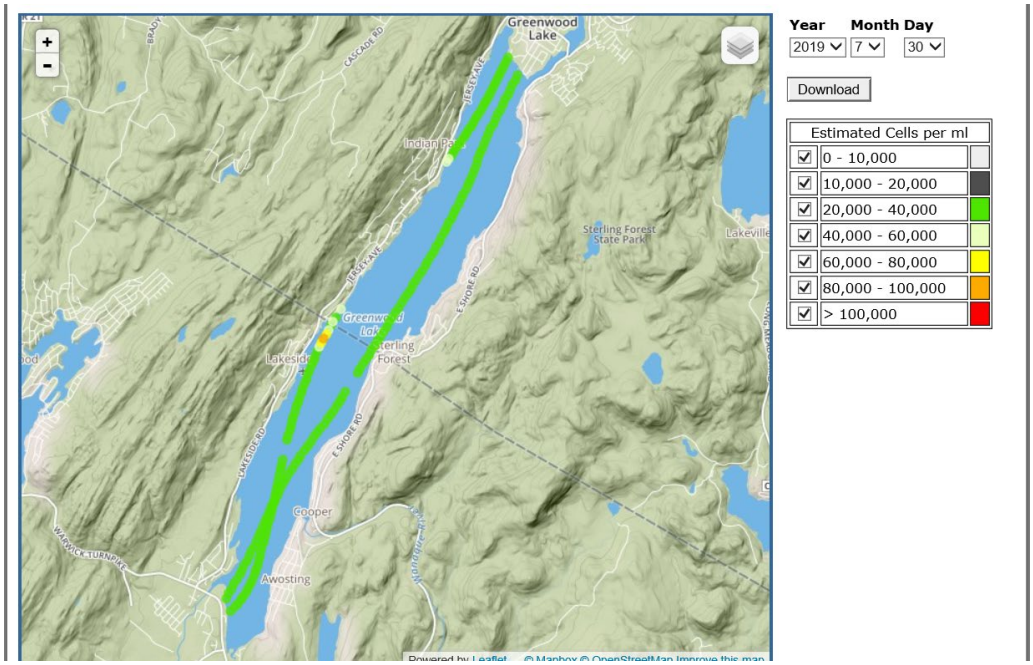


Flight Results

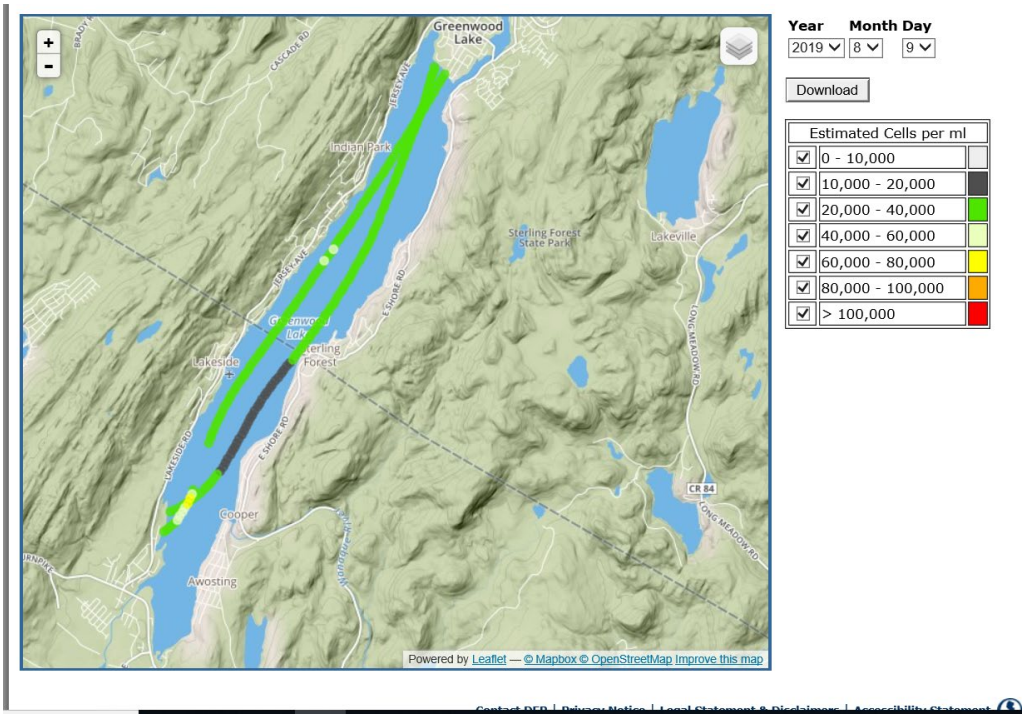
The 7/17/19 flight over Greenwood Lake detected lake wide cyanobacteria distribution, with the highest levels being detected in the New Jersey side of the lake.



The 7/30/19 flight over Greenwood Lake is detecting the presence of cyanobacteria in both NJ and NY waters and the pale-yellow color on the scale suggests cell counts greater than 20,000 cell/ml. This sensor is a general estimate and will be refined by comparison to lab analyzed cell counts.

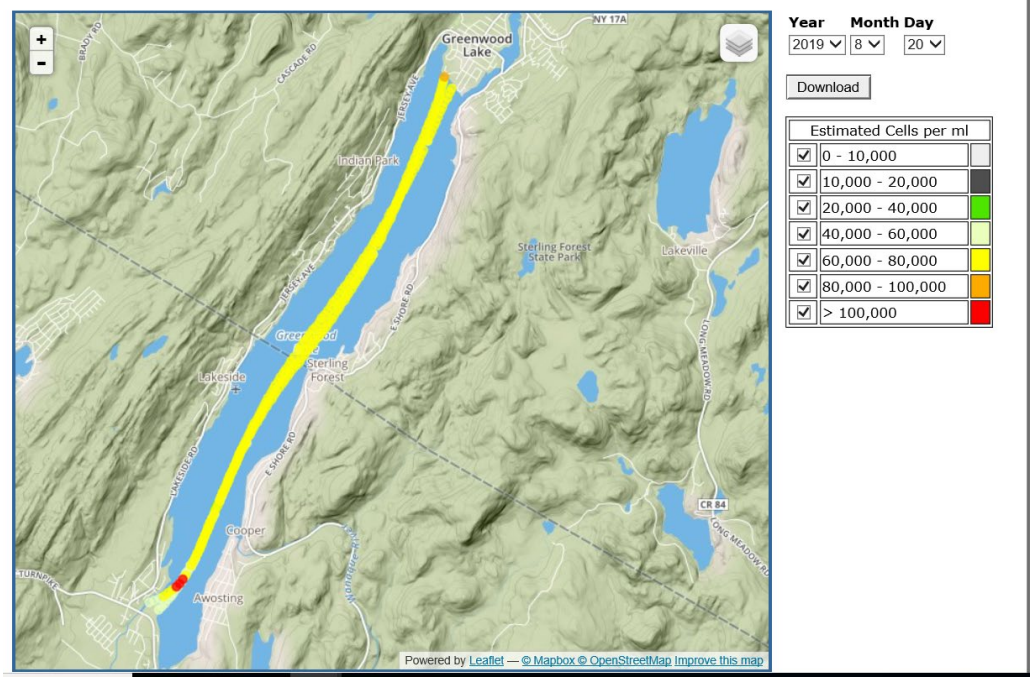


On 8/9, Greenwood Lake's spatial distribution changed slightly, but there are estimated cell counts greater than 60,000, in one area, and there is still the presence of the bloom lake wide.

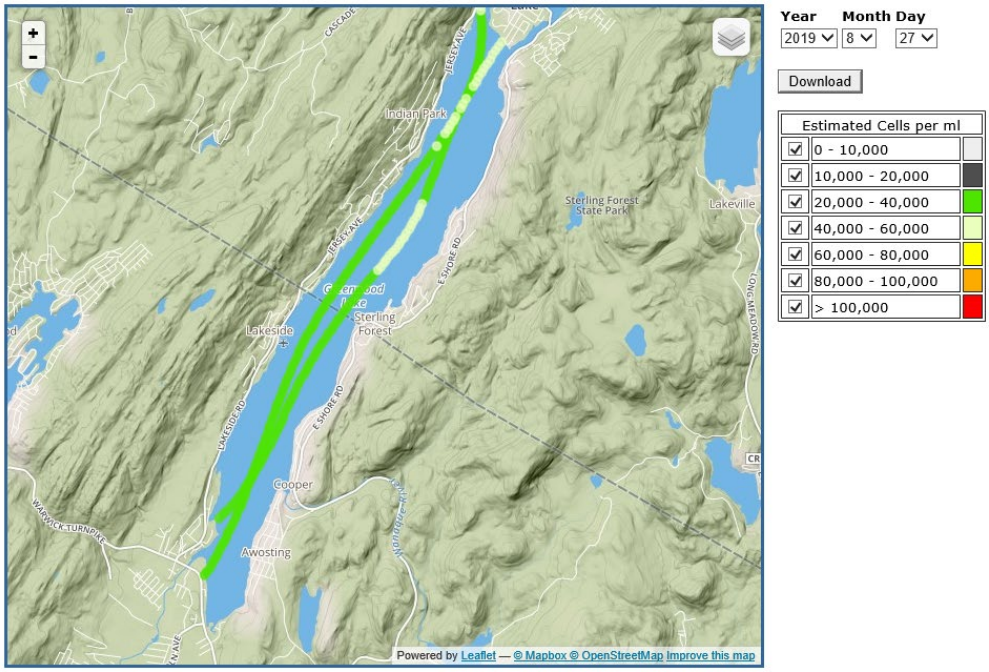


On 8/20, the spatial distribution of an intense bloom has increased lake wide; phycocyanin levels are high

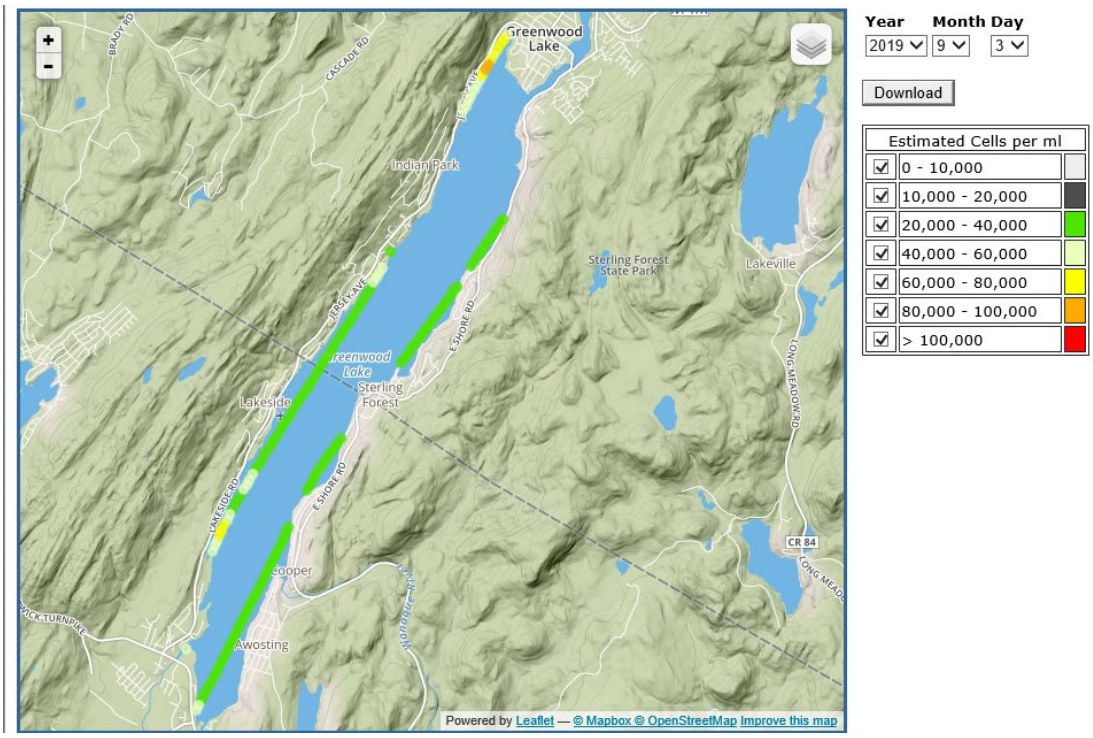
during the summer months, in favorable weather conditions, over the coastal waters of New Jersey. These flights provide a valuable perspective on water conditions and trends that enable the Bureau to target boat sampling in locations where algal blooms may be occurring.



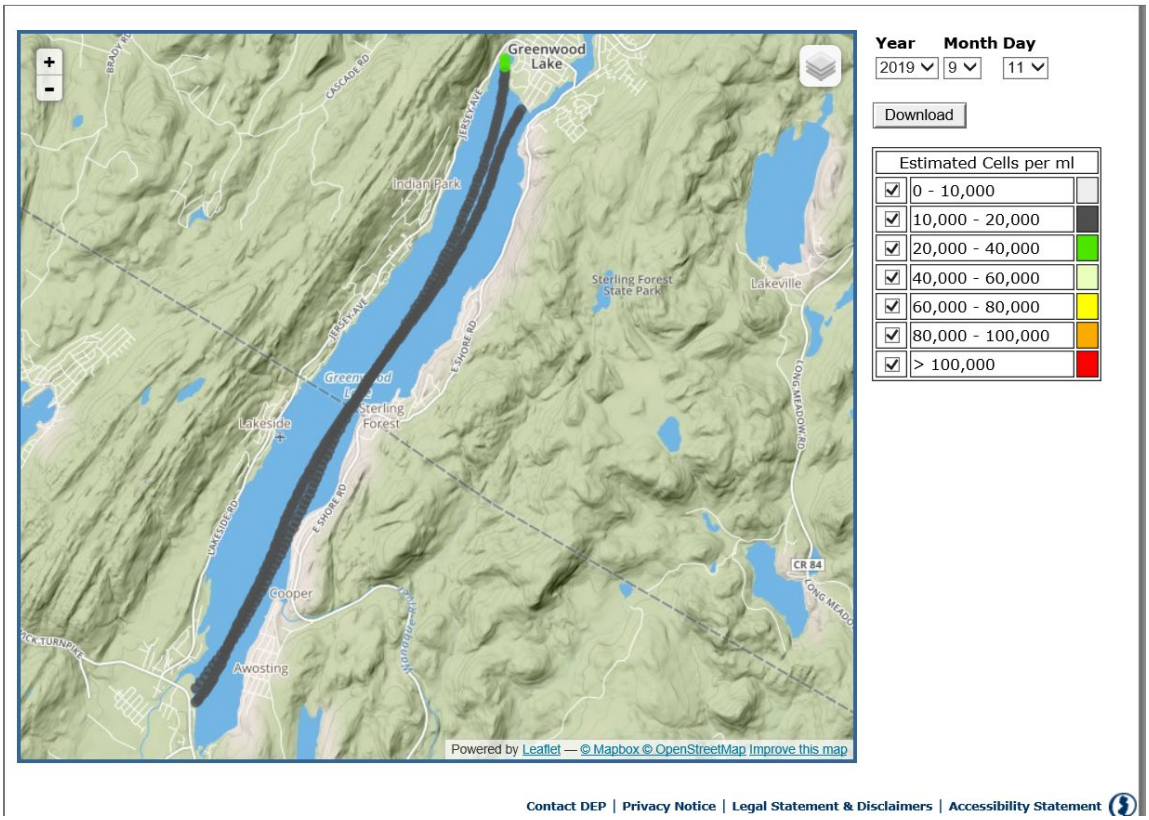
On 8/27, the spatial distribution of an intense bloom continues to be lake wide. The intensity appears to be lower or it may be due to the cloud cover which limits the amount of cyanobacteria present at the surface where the aircraft sensor detects the reflectance.



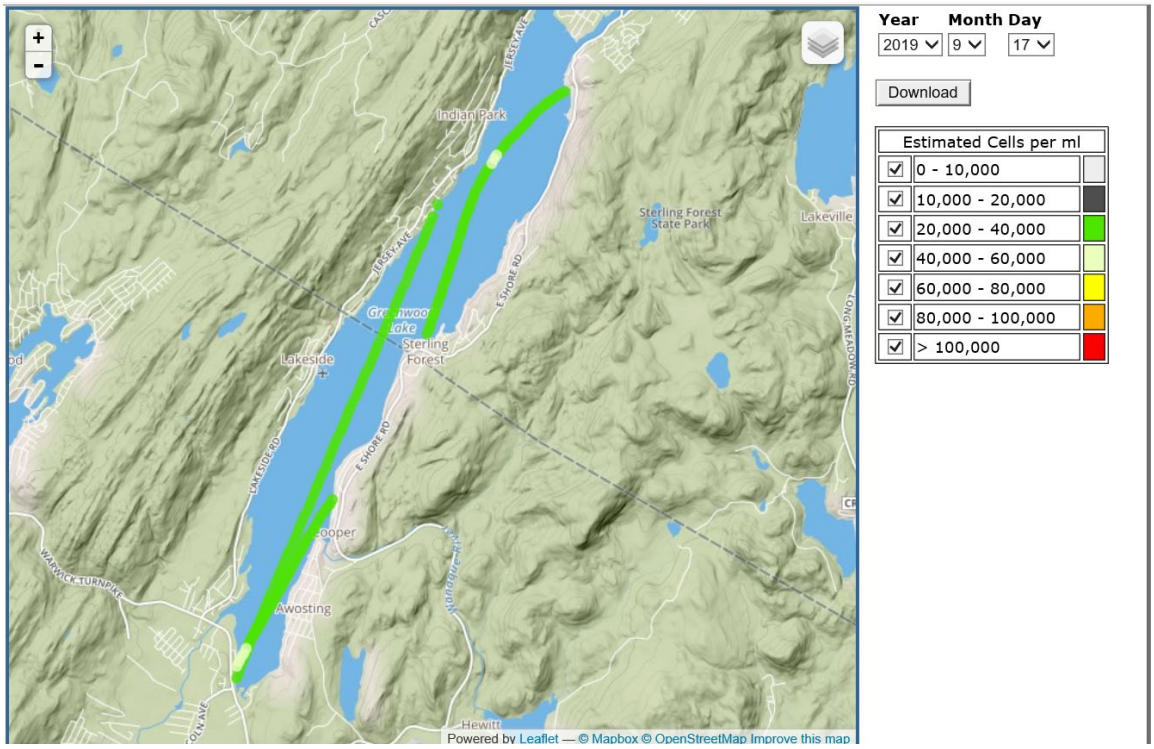
On 9/3, the spatial distribution of a bloom is lake wide. Some of the highest levels are on the New York side, but there are some high levels in New Jersey on the south west shoreline.



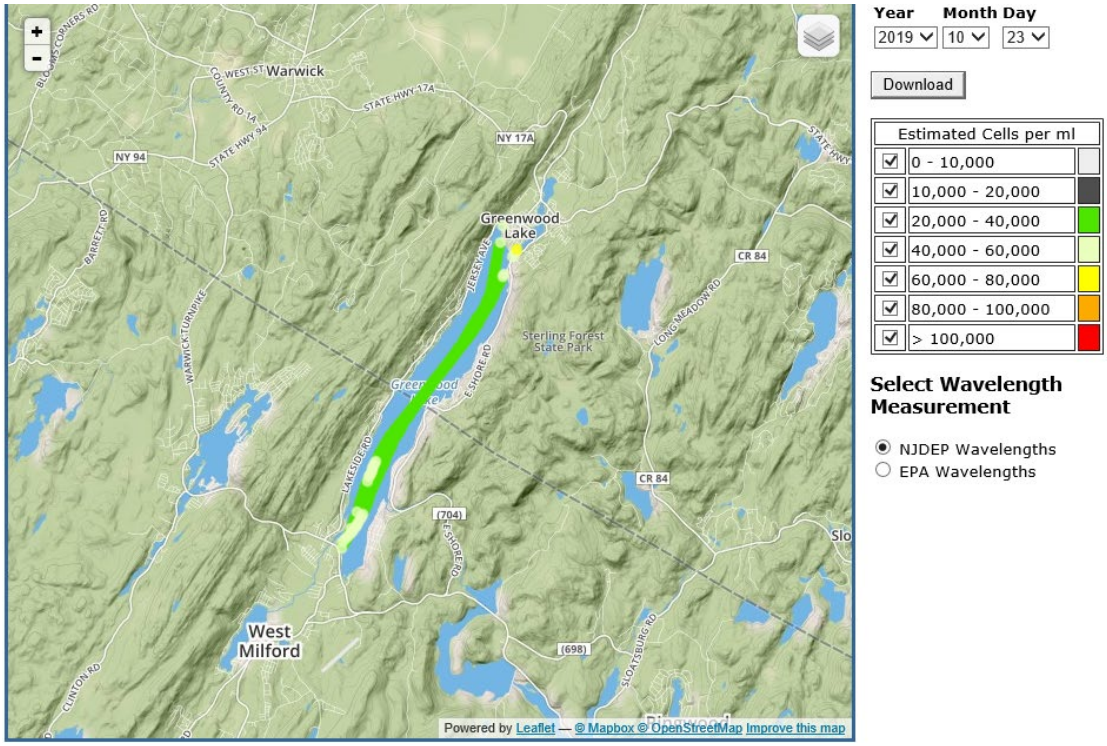
On 9/11, Greenwood Lake is showing much lower levels since last week, which may be showing the start of a declining trend.



On 9/17, flight data is still estimating bloom conditions lake-wide.



On 10/23, flight data shows higher pockets in the south with generally lower levels than previously seen.



On 11/6, flight data shows higher pockets in along the southwest shoreline.