

The 2018 Cayuga Lake HABs Monitoring Program

Discussion of Season Results

Presented by Nathaniel Launer, *Outreach Coordinator*



Cyanobacteria on Cayuga Lake in 2018

The Community Science Institute documented 40 cyanobacteria blooms on Cayuga Lake this year that were confirmed.

- only 8 confirmed cyanobacteria blooms in 2017 (NYSDEC, 2017)
- impossible to say how much of this increase is due to improved monitoring

Of the 34 bloom samples tested for *microcystin* levels, 24 or 70% had microcystin toxin levels above acceptable limit of 4 ug/ L for ambient water set by NYS Department of Health.

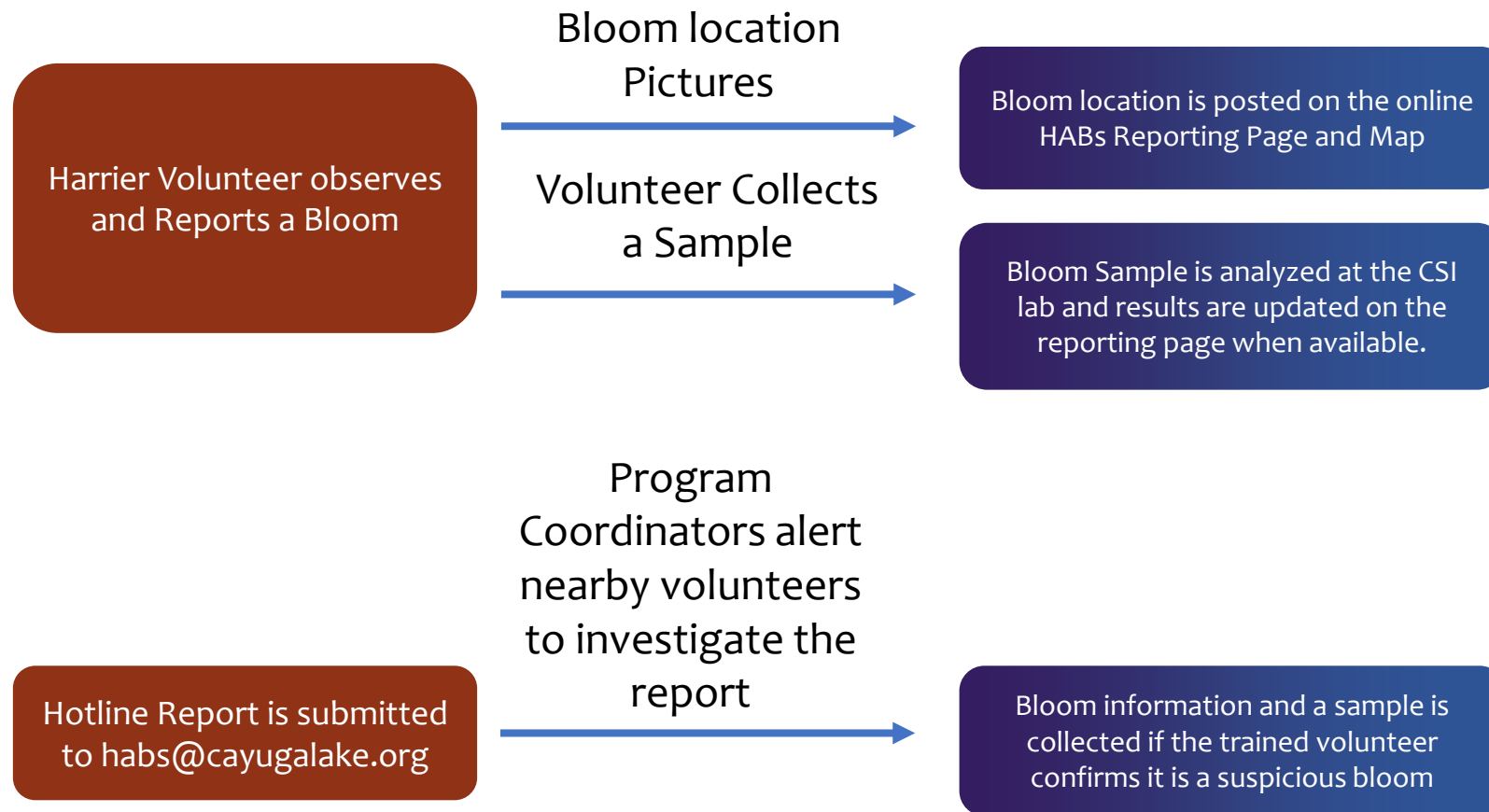
Why Monitoring/ What are we looking for?

Risk Assessment and Management

1. Assessing and communicating risk due to cyanobacteria blooms
2. Data collection to be used to support management



Suspicious Bloom Reporting Process

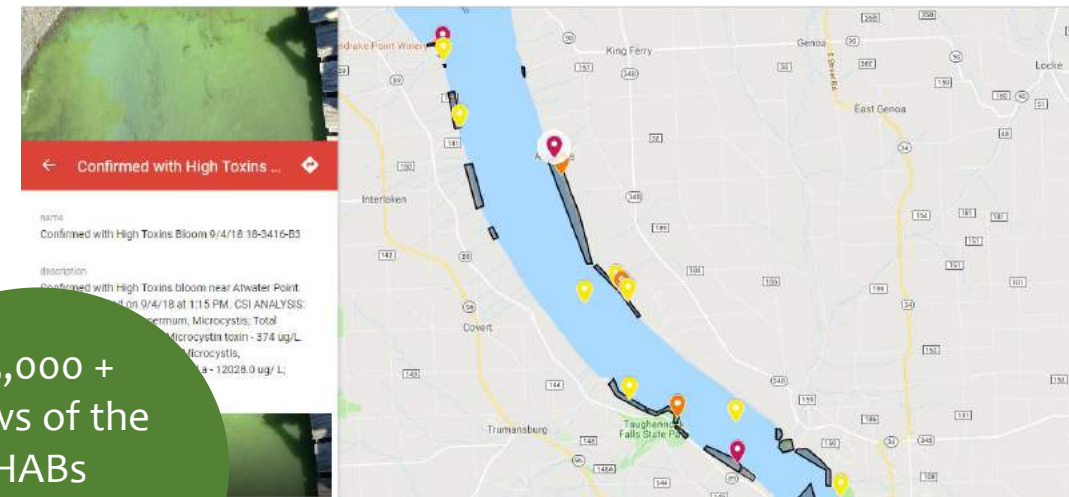
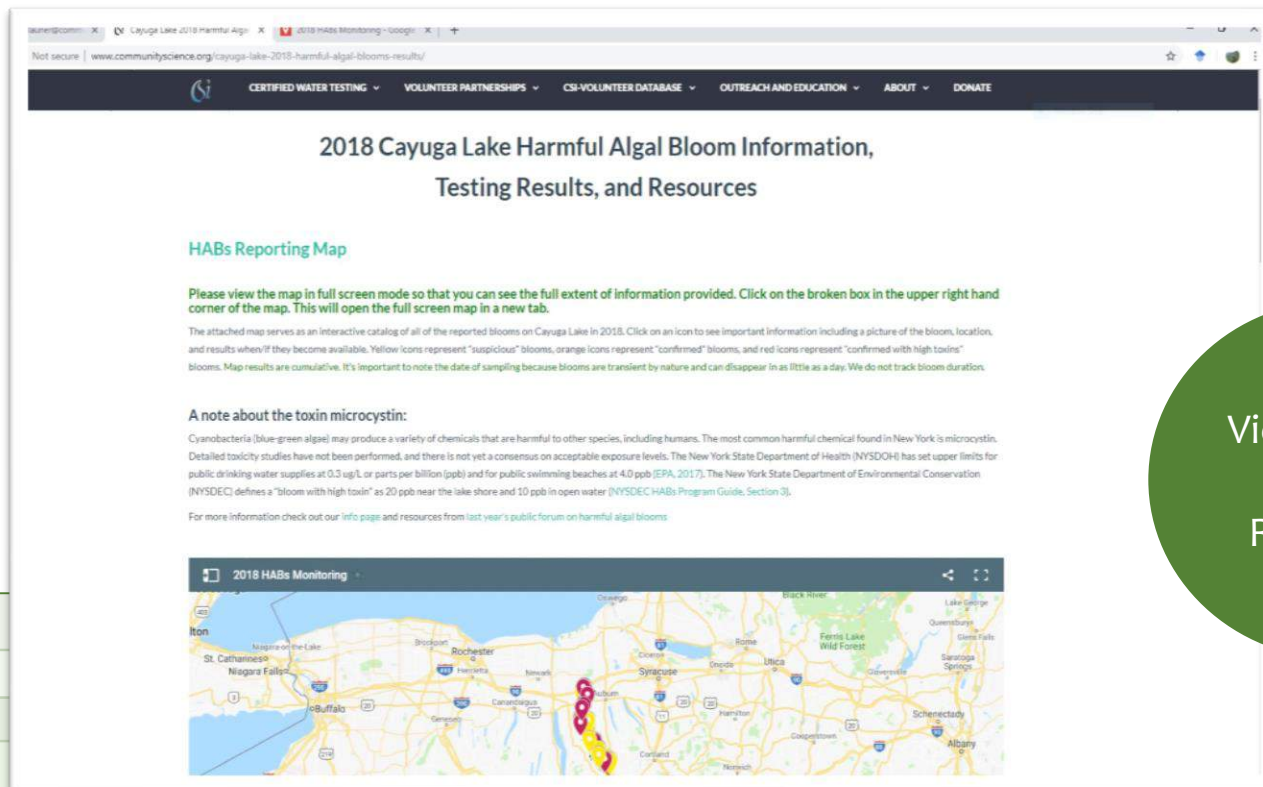


1. Risk assessment and communication

Bloom location is promptly posted on the HABs Reporting Page on the Community Science Institute website.

Analysis results are updated as soon as available: Whether cyanobacteria are present, level of microcystin toxin, and concentration of total chlorophyll a

Weekly emails summarizing recent HABs occurrences are sent to volunteers and stakeholders.



25,000 + Views of the HABs Reporting Map

Bloom Information				Bloom Location Information			CSI Analyses (only including if samples are not tested)				Sample sent to DEC contract lab?		
Queue#	Date Reported	Date Reported	Time Sampled	Date Sample Received	Location Description	Latitude	Longitude	Description	Analysis Date	Result in ug/L		Analysis Date	Result in ug/L
	7/22/18				Long Point State Park 10/18	42.7158	-76.7186	Sample not collected	7/26/18	348	7/26/18		
	7/22/18				Winged Rd - Just south of Olears Cove 7/2/18	42.7392	-76.7471	Sample not collected	7/26/18	1188	7/26/18		
376	7/22/18	7/22/18	10:00:18	7/26/18	Long Point State Park 10/18	42.7158	-76.7186	Dulcic exposure	7/26/18	348	7/26/18	0.38	7/26/18
377	7/22/18	7/22/18	15:00:18	7/26/18	Olears Cove Boat Launch	42.7447	-76.7471	Dulcic exposure	7/26/18	1188	7/26/18	0.38	7/26/18
378	7/22/18	7/22/18	14:00:18	7/26/18	2547 Lake Rd. Access - Between Long Point	42.7217	-76.7381	Dulcic exposure	7/26/18	773	7/26/18	0.38	7/26/18
379	7/22/18	7/22/18	12:50:18	7/26/18	King Ferry North of Millken	42.6247	-76.8484	Dulcic exposure	7/26/18	338	7/26/18	0.38	7/26/18
380	7/22/18	7/22/18	11:30:18	7/26/18	Lansing Station Rd. Lansing	42.5837	-76.8170	Dulcic exposure	7/26/18	334	7/26/18	0.38	7/26/18
381	7/22/18	7/22/18	10:00:18	7/26/18	Lansing Station Rd. Lansing	42.5837	-76.8220	Dulcic exposure	7/26/18	338	7/26/18	0.38	7/26/18
382	7/22/18	7/22/18	18:00:18	7/26/18	South of Long Point State Park 10/18 Suspension Station at Camp Carson Campground	42.7132	-76.7380						



2. Supporting potential management strategies

When do cyanobacteria blooms occur on Cayuga Lake?

Which cyanobacteria genera are associated with microcystin toxin?

When do blooms have the highest toxin levels?

Where do blooms occur?

Data collected through monitoring supports risk assessment and risk management strategies.

When do blooms occur on Cayuga Lake?

In July, 16 cyanobacteria blooms were confirmed.

- only two of these blooms had toxin levels above 4 ug/ L.

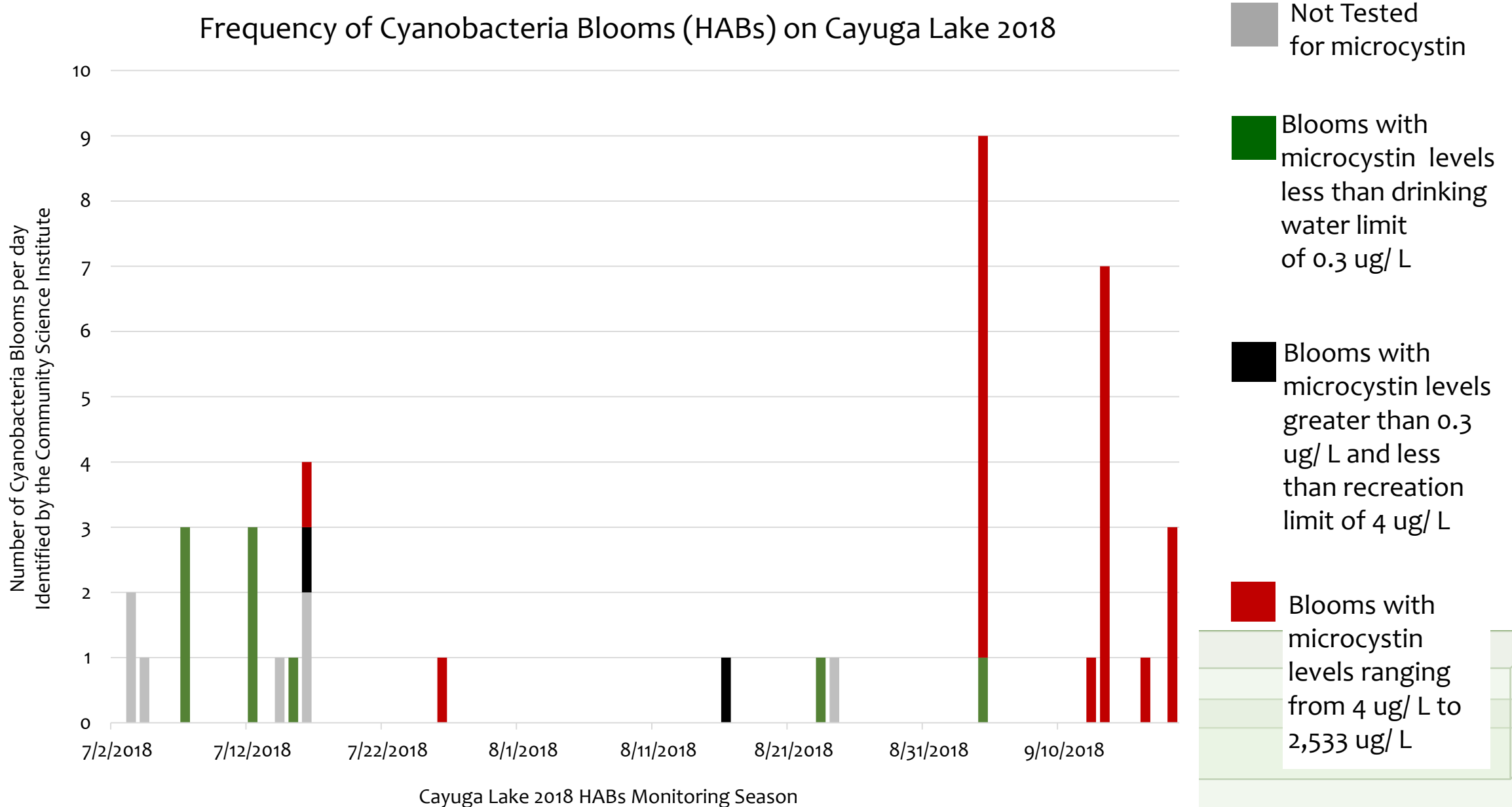
In August, 3 cyanobacteria blooms were confirmed.

- none of these had toxin concentrations above 4 ug/ L.

In September, 21 cyanobacteria blooms were confirmed.

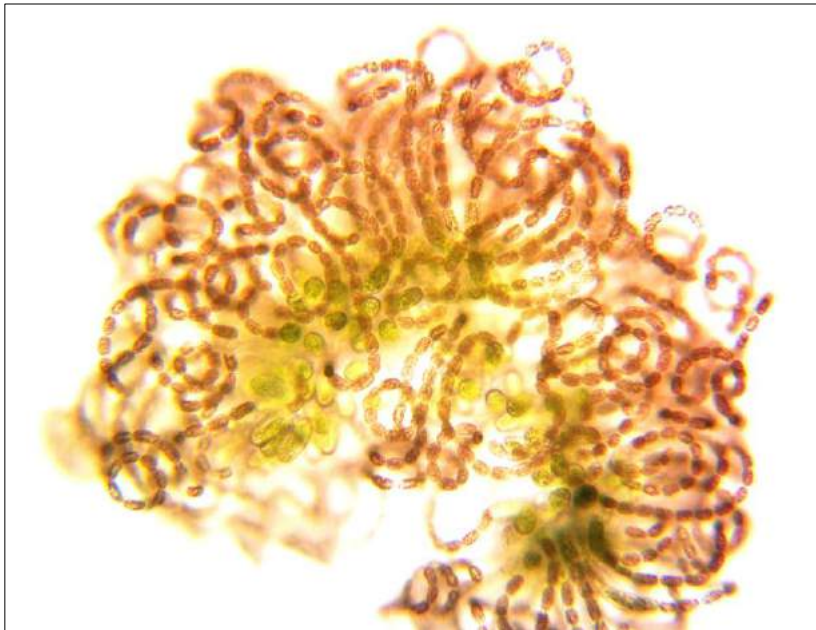
- 20 of these blooms had toxin levels above 4 ug/ L.

When did blooms occur on Cayuga Lake?



Which cyanobacteria genera were associated with microcystin toxin in 2018?

Most blooms with toxin levels above DOH limits were dominated by *microcystis*.

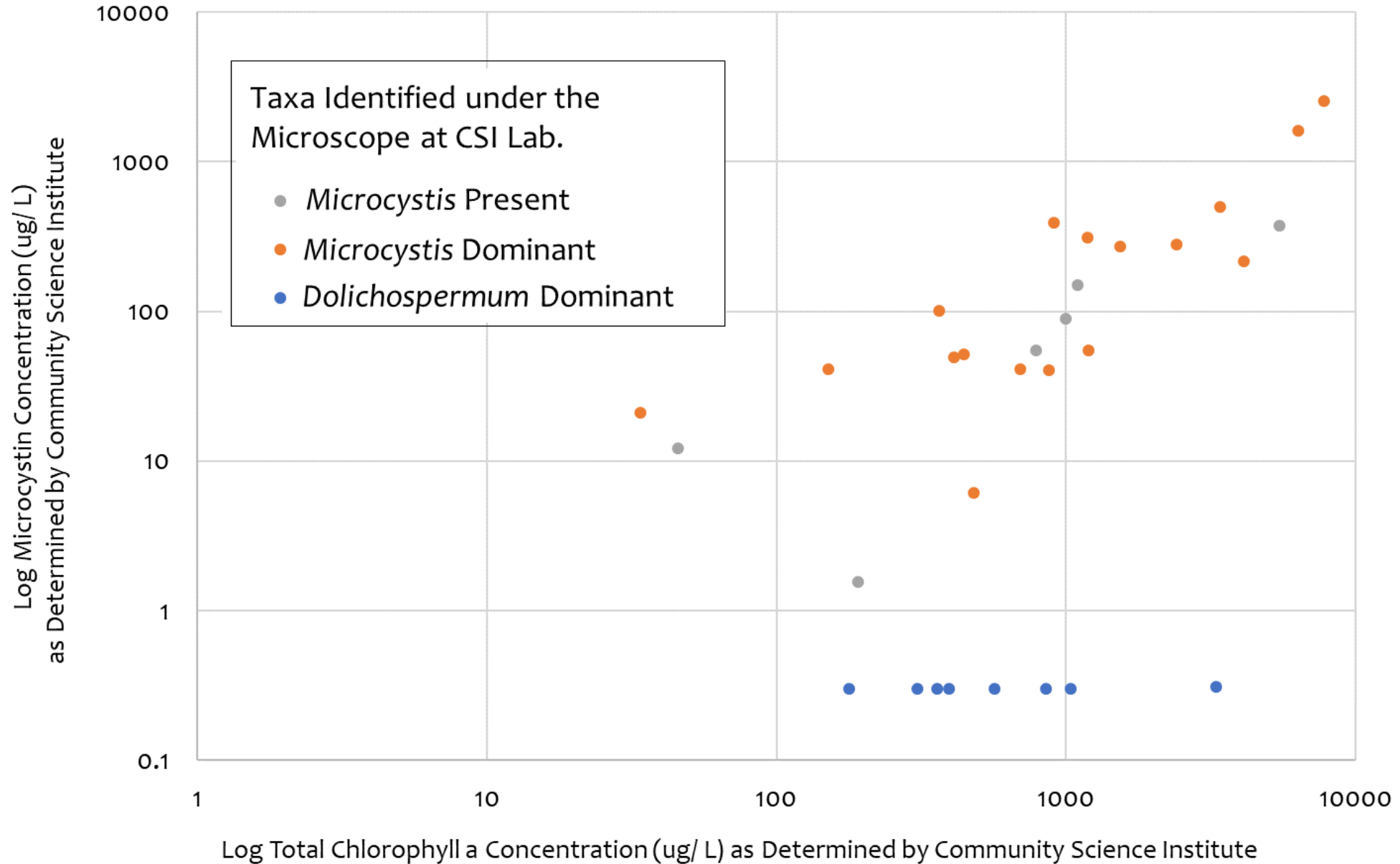


Eight of the ten blooms tested for *microcystin* by CSI in 2018 that were dominated by *Dolichospermum* had *microcystin* concentrations below 4 ug/ L.



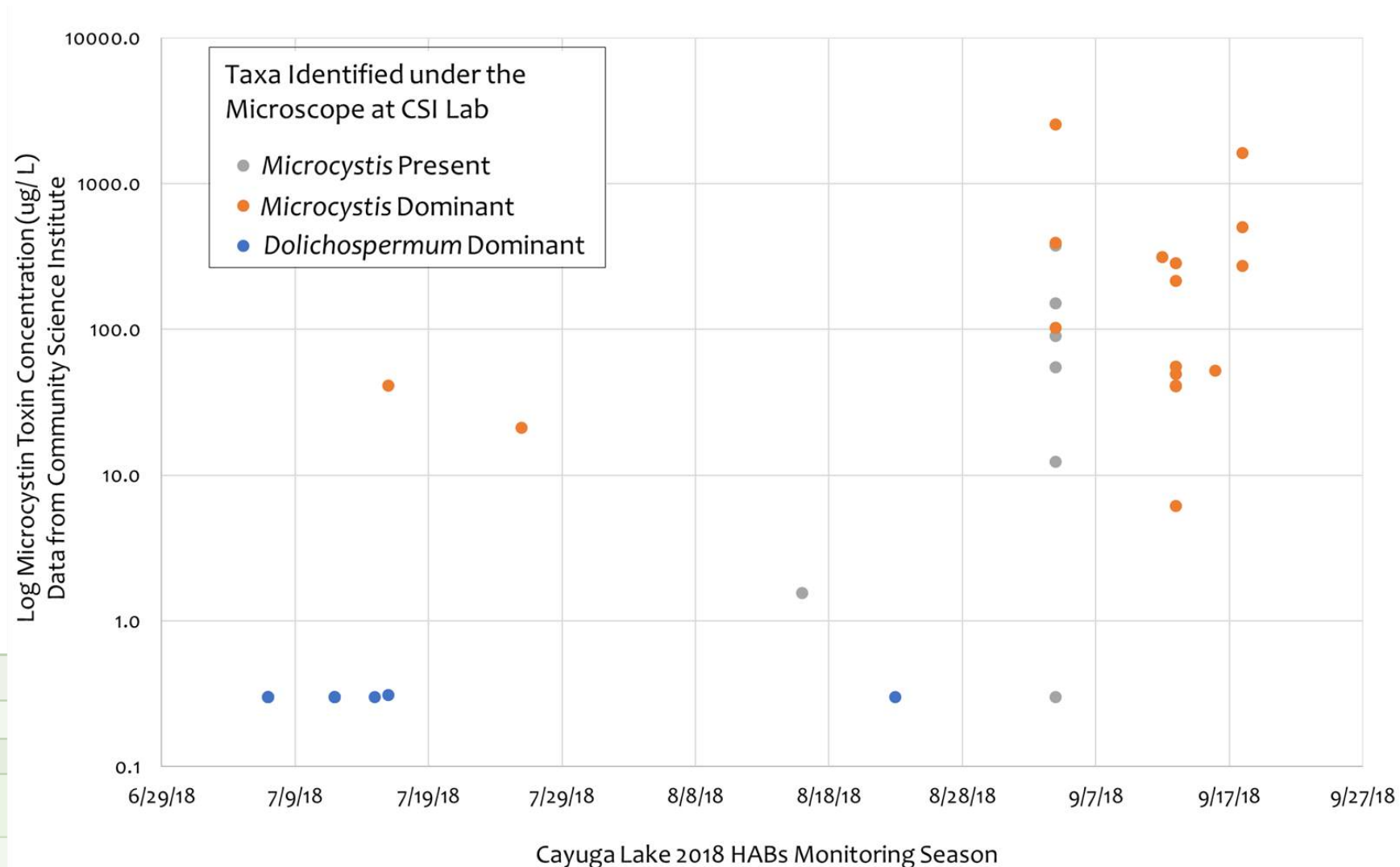
Of the 24 blooms tested for *microcystin* by CSI in 2018 that were dominated by *Microcystis*, 22 had *microcystin* concentrations above 4 ug/ L.

Microcystin Toxin Increased with Cyanobacteria Biomass when *Microcystis* Taxa were Present or Dominant



When did blooms have the highest toxin levels in 2018?

- blooms sampled in September had higher toxin concentrations than those sampled in July and August.



Mapping

Northwestern Quadrant

18 Volunteers

12 Bloom Samples Collected

Northeastern Quadrant

19 Volunteers

9 Bloom Samples Collected

Southwestern Quadrant

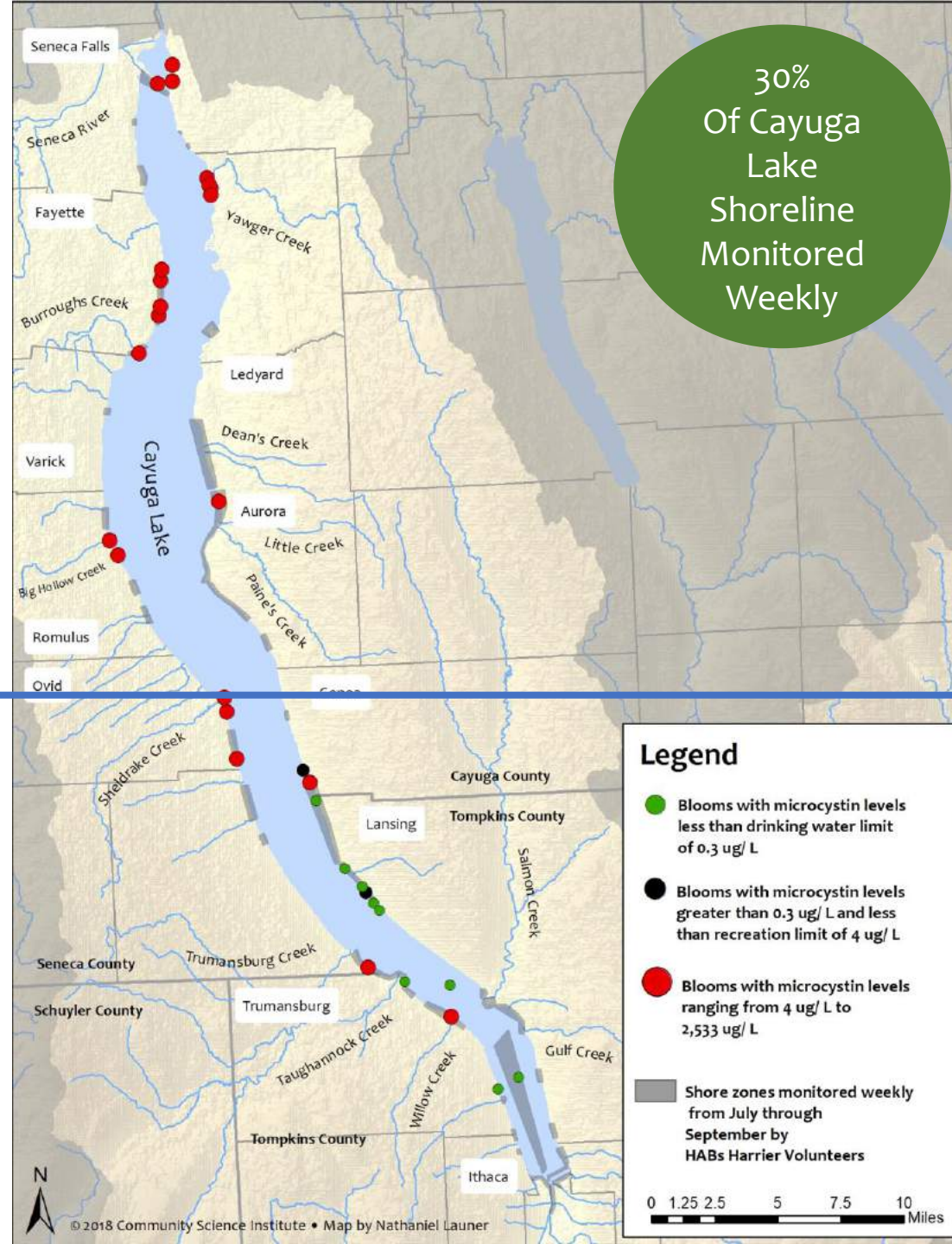
16 Volunteers

7 Bloom Samples Collected

Southeastern Quadrant

19 Volunteers

11 Bloom Samples Collected



Sheldrake Point



Occurrence of confirmed cyanobacteria blooms on Cayuga Lake appeared to increase in 2018 compared to the previous year, though much of this may be due to improved monitoring efforts.

Nearly all blooms on Cayuga Lake in 2018 with toxin levels above state drinking water and recreation limits contained the cyanobacteria *Microcystis*.

A sharp rise in bloom toxin levels was observed in later summer months on Cayuga Lake in 2018.

On Cayuga Lake in 2018, 77% of the blooms with *microcystin* concentrations above 4 ug/ L occurred in the northern half of the lake.

Monitoring is essential for

1. Assessing the risk that cyanobacteria blooms may or may not present.
2. Data collection to support risk management

Thank You

We are here to help!

If you would like more information, please contact
the Community Science Institute at
info@communityscience.org or (607) 257-6606