Seneca Lake **PURE WATERS** Association

Seneca Lake HABs Monitoring Program

Presentation by:

Frank DiOrio and Bill Roege

Agenda

- Program Basics – Frank
- 2018 HAB Results Review – Bill
- HABs Learnings – Frank

Bloom Terminology

- HABs (Harmful Algal Blooms)
- Blue Green Algae
- Cyanobacteria
- Same!!!

HABs in the News

Finger Lakes Times

Serving Ontario, Seneca, Wayne and Yates counties • 121st year

Geneva, N.Y.

$1.25

Number of reported HABs growing

Two Seneca Lake samples positive, with seven more pending

By DAVID L. SHAW

dshaw@fltimes.com

GENEVA — A mostly warm September thus far is creating the conditions that seem to be ideal for harmful algal blooms. The number of water bodies statewide with reported HAB had grown to 90 as of Friday. The state Department of Environmental Conservation's HABs notification web page added 21 Waters Association, a group that has more than 100 trained volunteers. "Our volunteer reports, the hotline calls and emails all support the fact that we have entered the peak activity period for blooms. This timing pattern is very similar to what we experienced around the lake last year." Pure Waters volunteers have been monitoring Seneca Lake for seven weeks, and plan to do so for three more weeks. Among the bodies of water on the state list, HABs have been determined to be widespread in Canandaigua, Cayuga and Honeoye lakes. Two of Canandaigua Lake's beaches have been closed to swimming since last

Steve Buchiere / Finger Lakes Times

A warning sign is seen along the shore at Lakefront Park in Geneva Monday morning because of a possible harmful algal bloom.

An AP Newspaper of Distinction

Reaching Over 28,872 Daily Readers!

News You Need

Tomorrow's weather

High: 70

Low: 52

Partly sunny,

abc 57 FIRST WARNING Neighborhood Weather

HARMFUL ALGAL BLOOMS

- Bloom season: July - October
- When algae grow rapidly, forming dense scums & water discoloration
- Impacts from HABs:
- Can produce neurotoxins, liver toxins and/or skin irritants
- Contaminate drinking water, harm swimmers and pets; toxins can be airborne
- Severely impact marine life

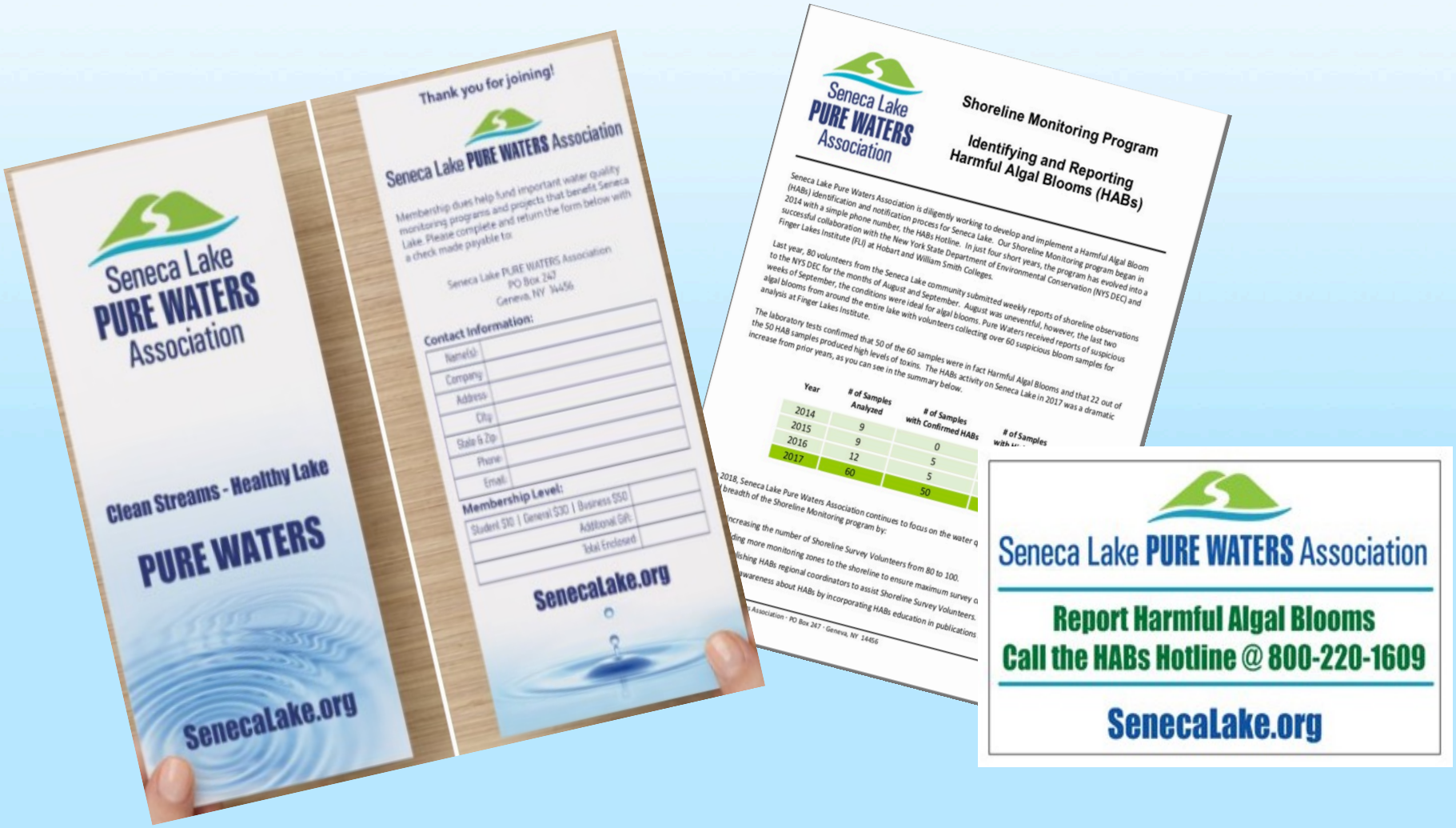
Collaborative Effort

- Finger Lakes Institute (FLI)
- NYS Department of Environmental Conservation (NYSDEC)
- Upstate Freshwater Institute (UFI)
- Seneca Lake PURE WATERS Association Volunteers

Program Evolution and Growth

- 2014 – Hot Line inquires
- 2015 – Continued with Hot Line
- 2016 – **40 volunteers**
- 2017 – **80 volunteers** covering 37 of 72 miles
- 2018 – **102 volunteers** covering 56 of 72 miles of shoreline

Volunteers as Advocates



2018 Program Objectives

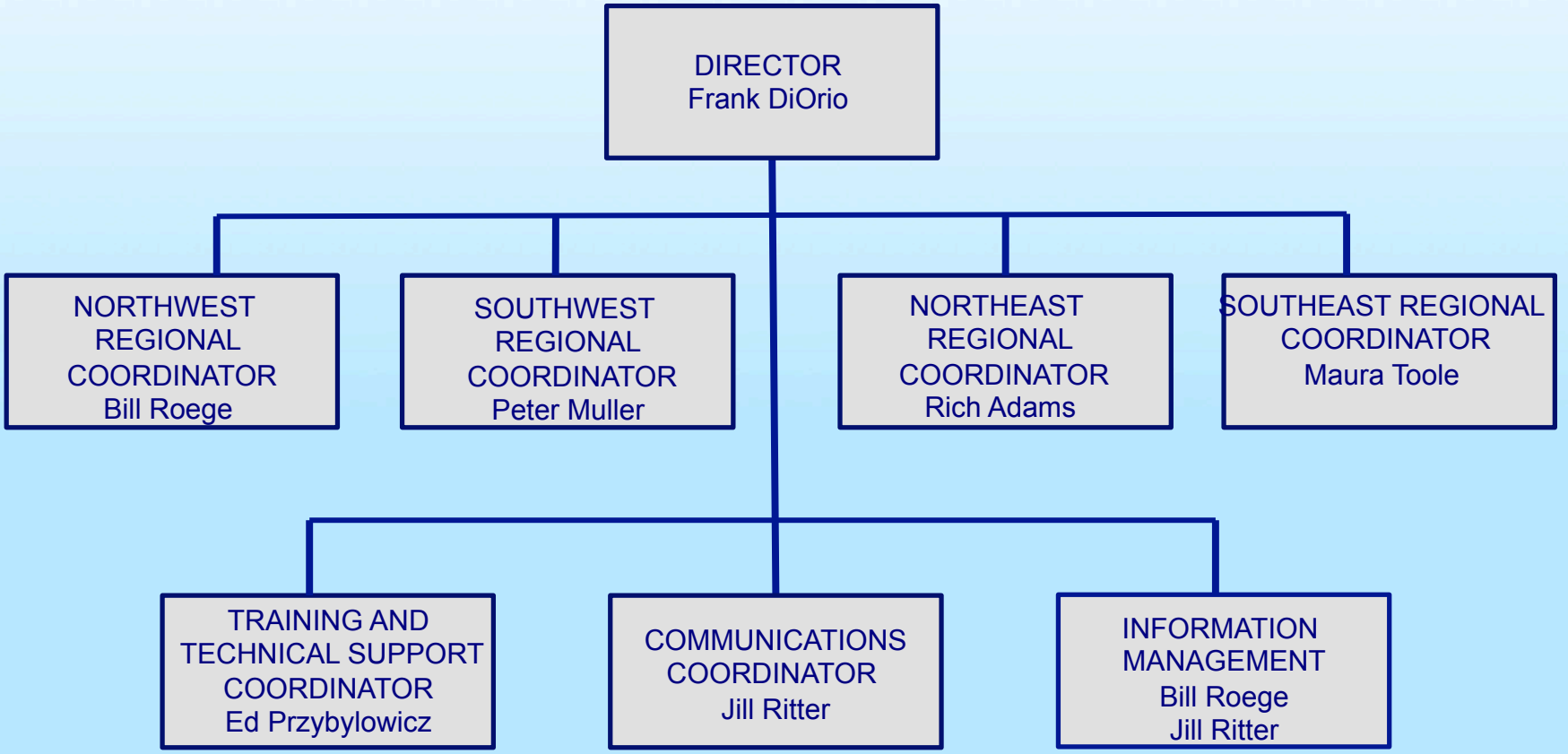
Short Term – provide users of Seneca Lake with a HABs alert system. Keep everyone informed and safe.

Long Term – acquire data to help enable reduction and elimination of blooms as part of our efforts to improve the future water quality of Seneca Lake.

2018 Focus Areas and Results

FOCUS AREAS	RESULTS
Safety	Residents, Volunteers and Pets Safe
Leverage Partnerships	On-going
Increase Volunteers	80 to 102
Expand Coverage	37 miles to 56 miles
New Organization Structure	Regional structure in place
Leverage Technology	Shoreline Observation System (SOS)

HAB Leadership Team



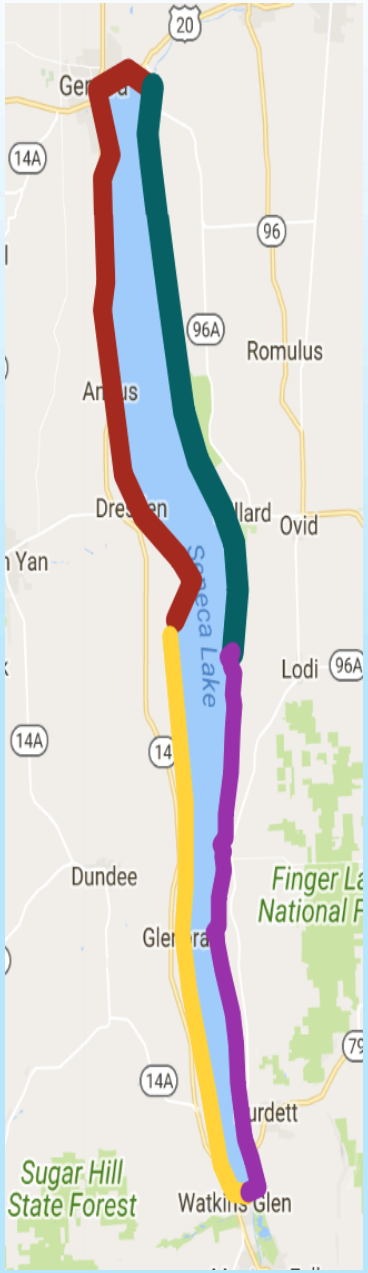
Seneca Lake Shoreline Regions

NW Region (RED) – Bill Roege, Regional Coordinator
- North boundary – Seneca River
- South boundary – South end of Long Point

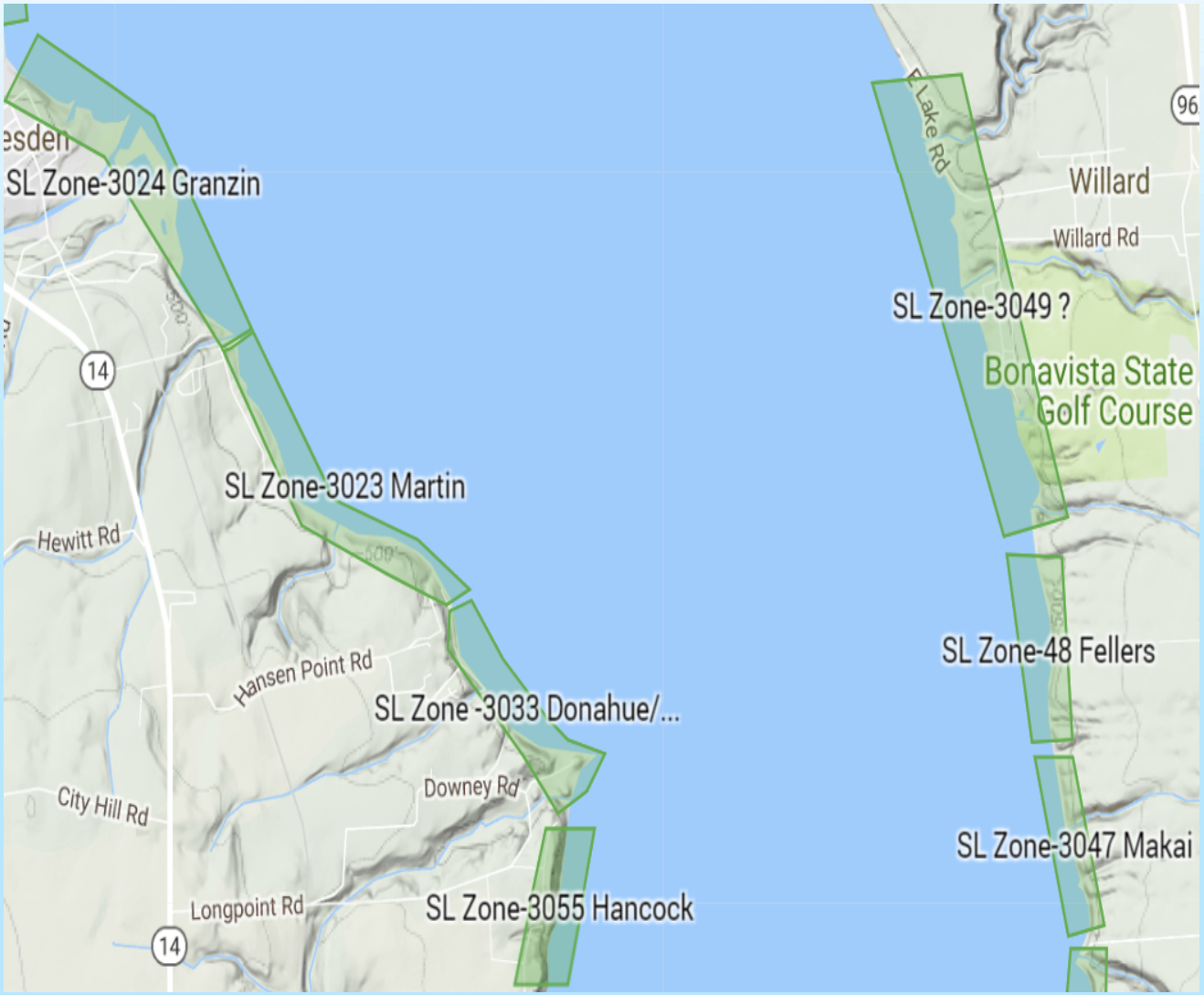
SW Region (YELLOW) – Peter Muller, Regional Coordinator
- North boundary – South end of Long Point
- South boundary – Catharine Creek

NE Region (GREEN) – Rich Adams, Regional Coordinator
- North boundary – Seneca River
- South boundary – Lodi Point State Park property

SE Region (PURPLE) – Maura Toole, Regional Coordinator
- North boundary– Lodi Point State Park property
- South boundary – Catharine Creek



Zone Map


SL Zone-3024 Granzin
SL Zone-3023 Martin
SL Zone -3033 Donahue/...
SL Zone-3055 Hancock
SL Zone-3049 ?
SL Zone-48 Fellers
SL Zone-3047 Makai
Willard
Willard Rd
Bonavista State Golf Course
Hewitt Rd
Hansen Point Rd
Downey Rd
City Hill Rd
Longpoint Rd
14
96

Process

Volunteers observe shoreline and submit weekly SOS report

Bloom?

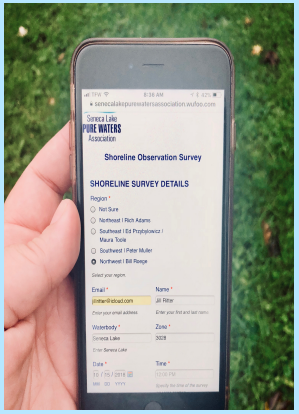
Yes

No

Take photos of bloom

Collect water sample and transport to FLI

Complete SOS Report



Above Threshold?

Yes

Send to UFI for toxin analysis

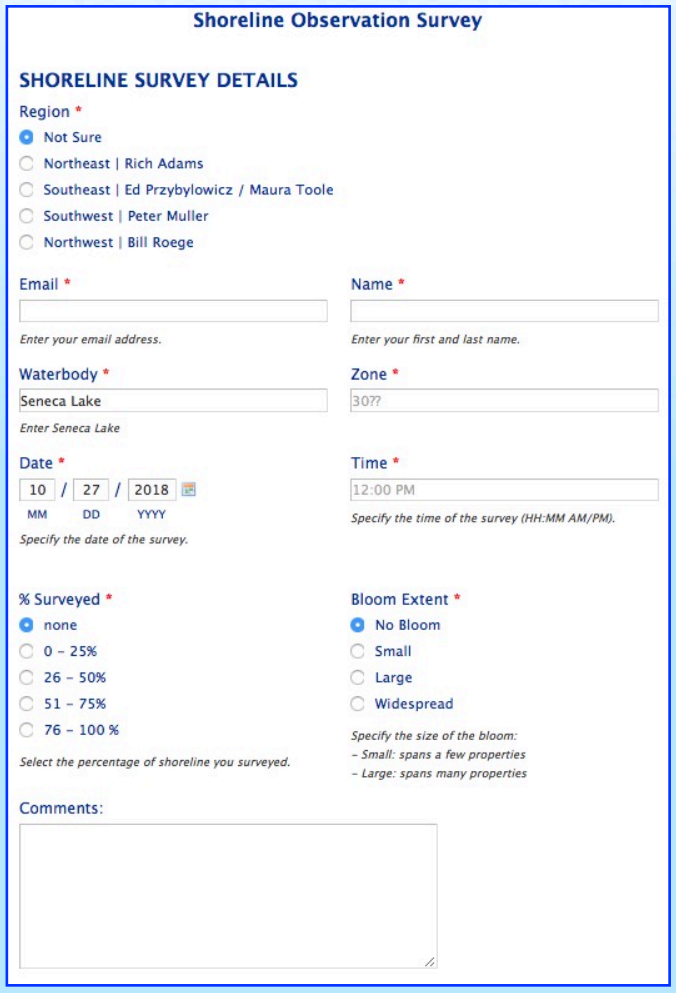
No

No further lab work

* **Monitoring Period 7/28 – 10/1**

* **SOS = Shoreline Observation Survey**

SOS Reporting Screens



Shoreline Observation Survey

SHORELINE SURVEY DETAILS

Region *
- Not Sure
- Northeast | Rich Adams
- Southeast | Ed Przybylowicz / Maura Toole
- Southwest | Peter Muller
- Northwest | Bill Roege

Email *
Enter your email address.

Name *
Enter your first and last name.

Waterbody *
Seneca Lake
Enter Seneca Lake

Zone *
30??

Date *
10 / 27 / 2018
MM DD YYYY
Specify the date of the survey.

Time *
12:00 PM
Specify the time of the survey (HH:MM AM/PM).

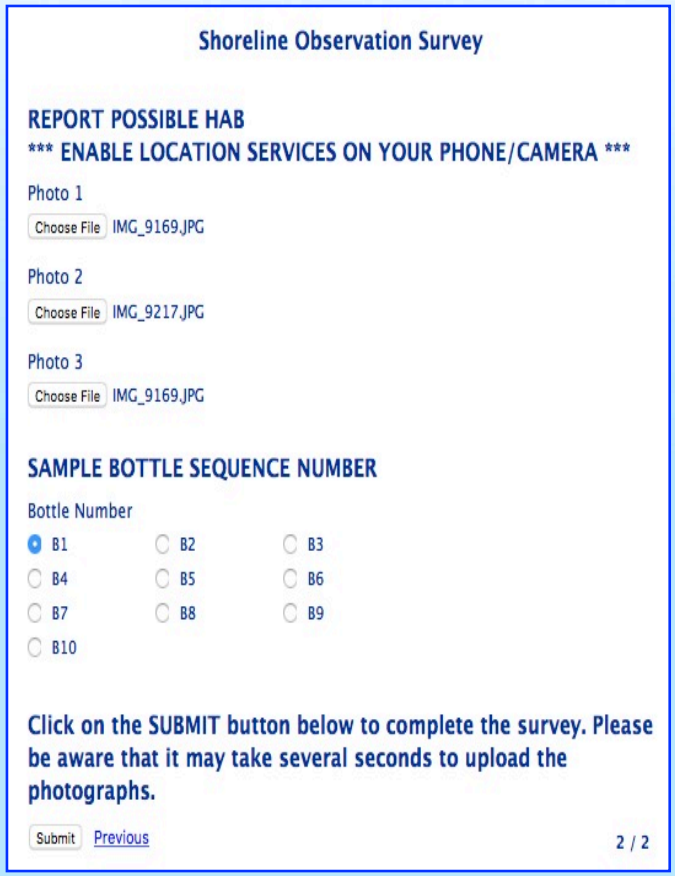
% Surveyed *
- none
- 0 – 25%
- 26 – 50%
- 51 – 75%
- 76 – 100 %

Select the percentage of shoreline you surveyed.

Bloom Extent *
- No Bloom
- Small
- Large
- Widespread

Specify the size of the bloom:
– Small: spans a few properties
– Large: spans many properties

Comments:



Shoreline Observation Survey

REPORT POSSIBLE HAB
*** ENABLE LOCATION SERVICES ON YOUR PHONE/CAMERA ***

Photo 1
Choose File IMG_9169.JPG

Photo 2
Choose File IMG_9217.JPG

Photo 3
Choose File IMG_9169.JPG

SAMPLE BOTTLE SEQUENCE NUMBER

Bottle Number
- B1 B2 B3
- B4 B5 B6
- B7 B8 B9
- B10

Click on the SUBMIT button below to complete the survey. Please be aware that it may take several seconds to upload the photographs.

Submit Previous 2 / 2

SenecaLake.org/SOS

Critical Values

RANGE OF BLUE GREEN CHLOROPHYLL > 25 µg/L = Confirmed Bloom

65 µg/L **58,876 µg/L**

RANGE OF MICROCYSTIN > 20 µg/L = Confirmed Bloom With High Toxins

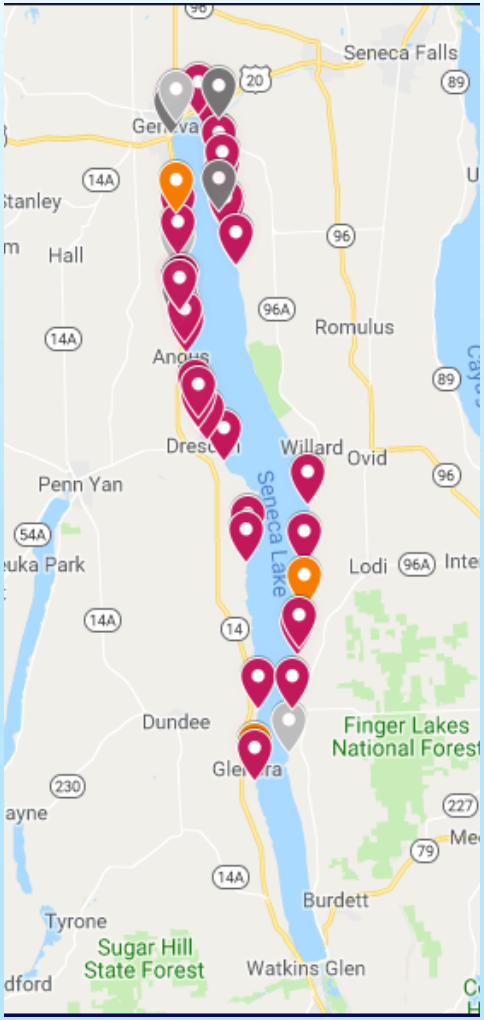
25 µg/L **2,100 µg/L**

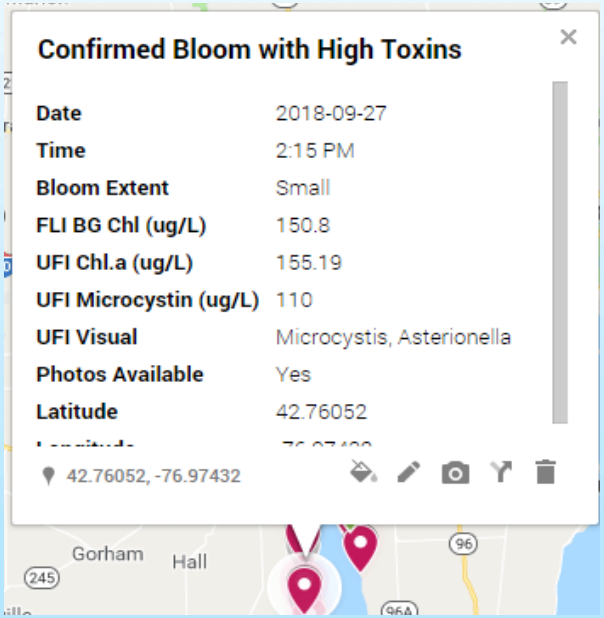
2014 - 2018 Results on Seneca Lake

Year	# of Samples Analyzed	# of Confirmed HABs	# Confirmed HABs with High Toxins
2018	41	39	36
2017	60	50	22
2016	12	5	2
2015	9	5	1
2014	9	0	0

Seneca Lake
2018 HAB Season Review

Interactive Bloom Map





Seneca Lake HAB Map

https://senecalake.org/2018-habs/

- Pins show sample location and color indicates DEC bloom status
- Clicking a pin shows the sample data for that point
- Co-located photos are in another layer and can be toggled on and off. (Look for camera icons)
- On the website, the legend drop down is in the upper left

Seneca Lake 2018 HAB Season Summary

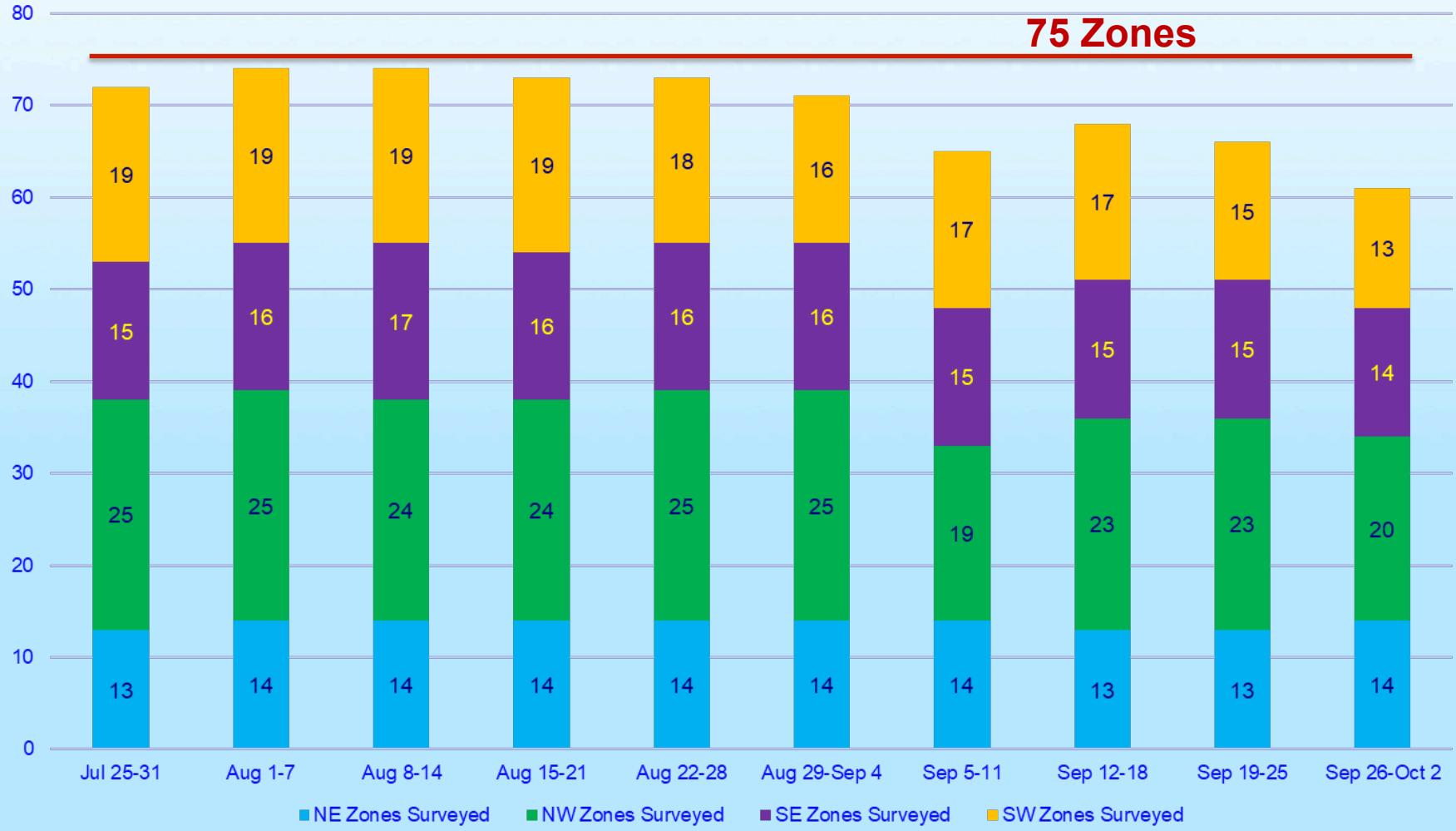
The HAB team did 741 survey reports (SOS) during the 2018 HAB season

Totals		Bloom Status	
Bloom Reports	48	Visual Reports	5
Samples Taken	43	No Status	2
FLI Assays	**41**	No Bloom	2
Sent to UFI	40	Suspicious Bloom	0
UFI BG Chl Assays	40	**Confirmed Bloom**	**3**
UFI Toxin Assays	39	**Confirmed Bloom with High Toxins**	**36**

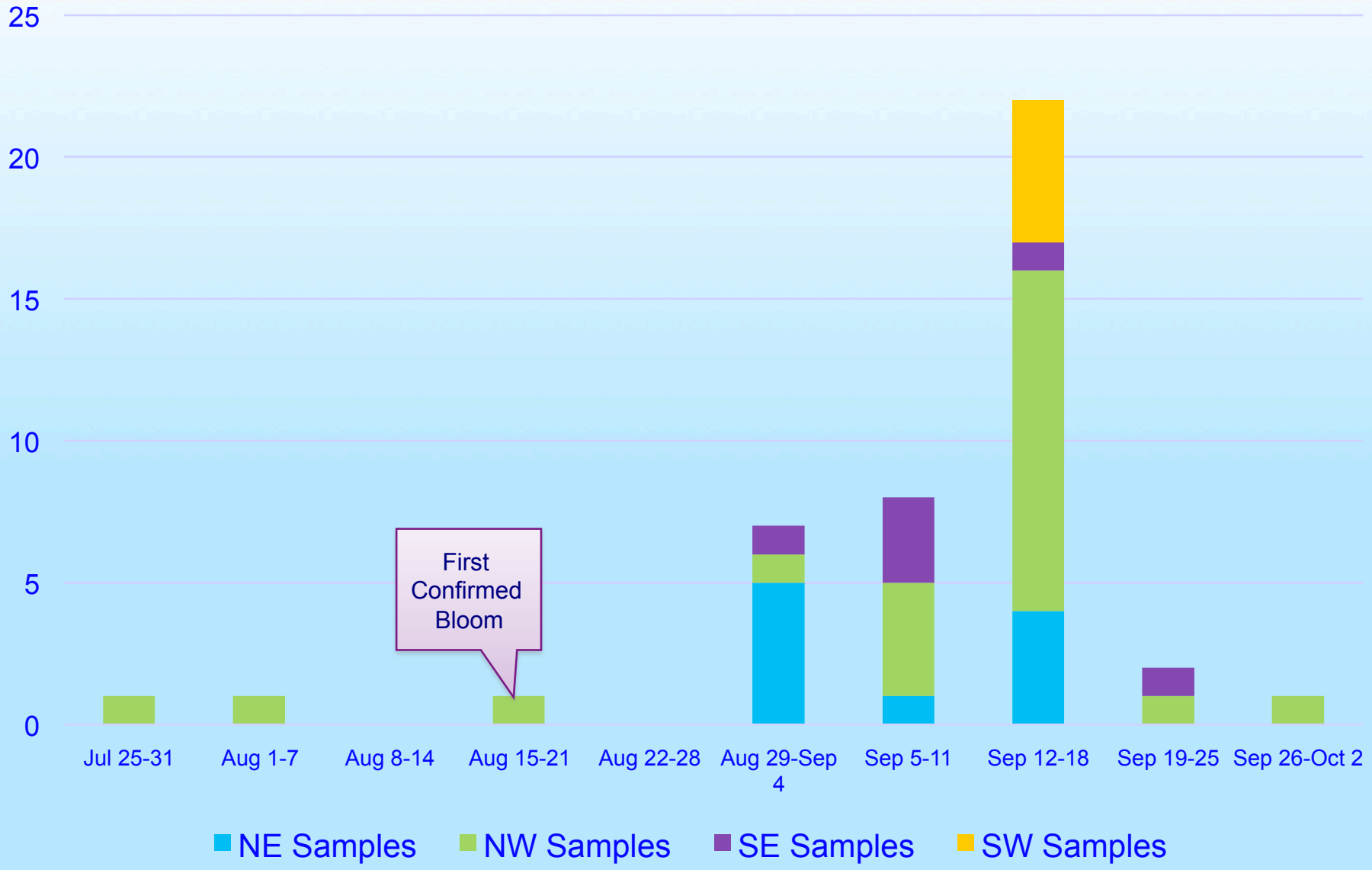
FLI = Finger Lakes Institute

UFI = Upstate Freshwater Institute

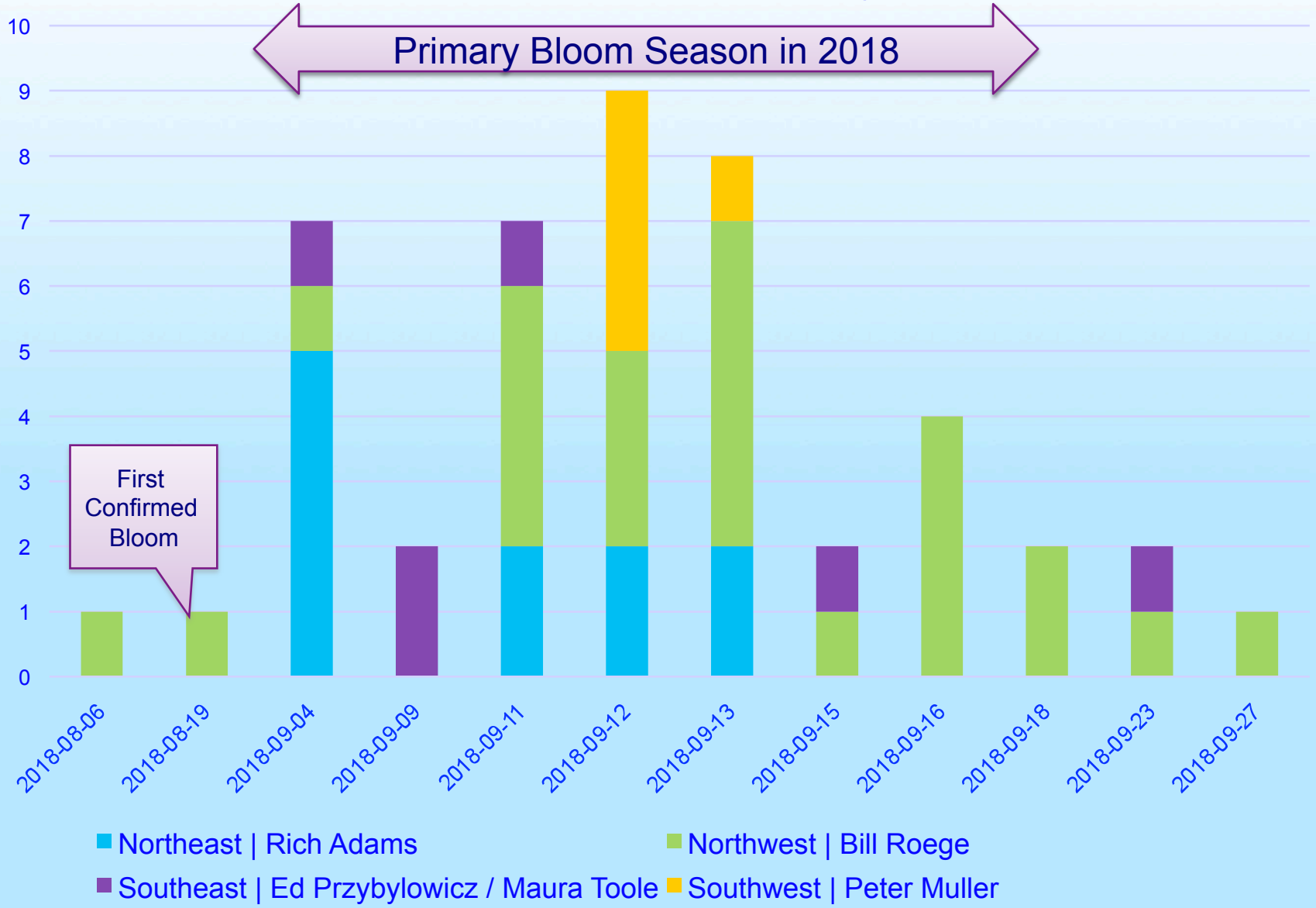
Seneca Lake 2018 HAB Surveys by Week



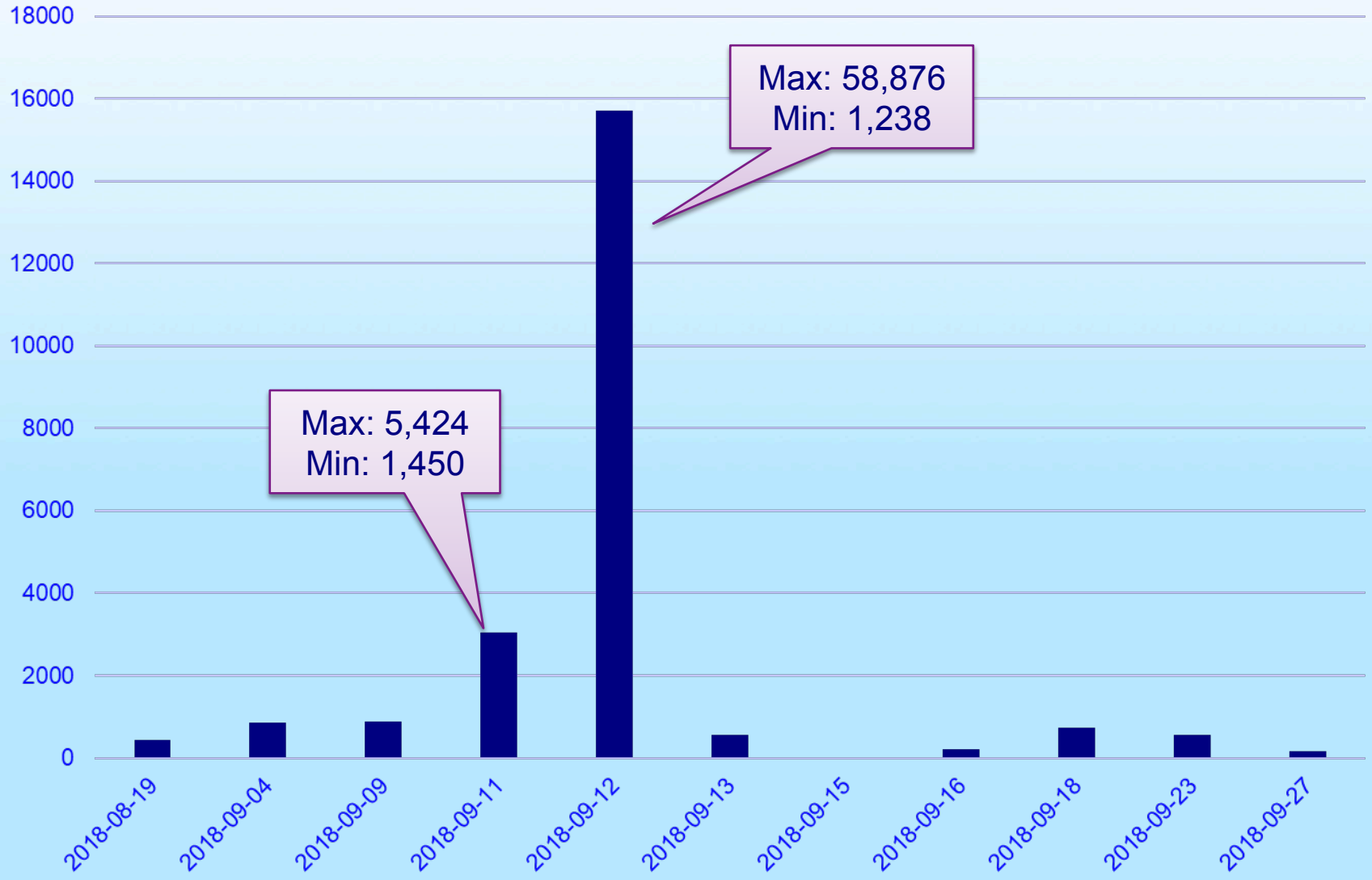
Seneca Lake 2018 HAB Samples by Week



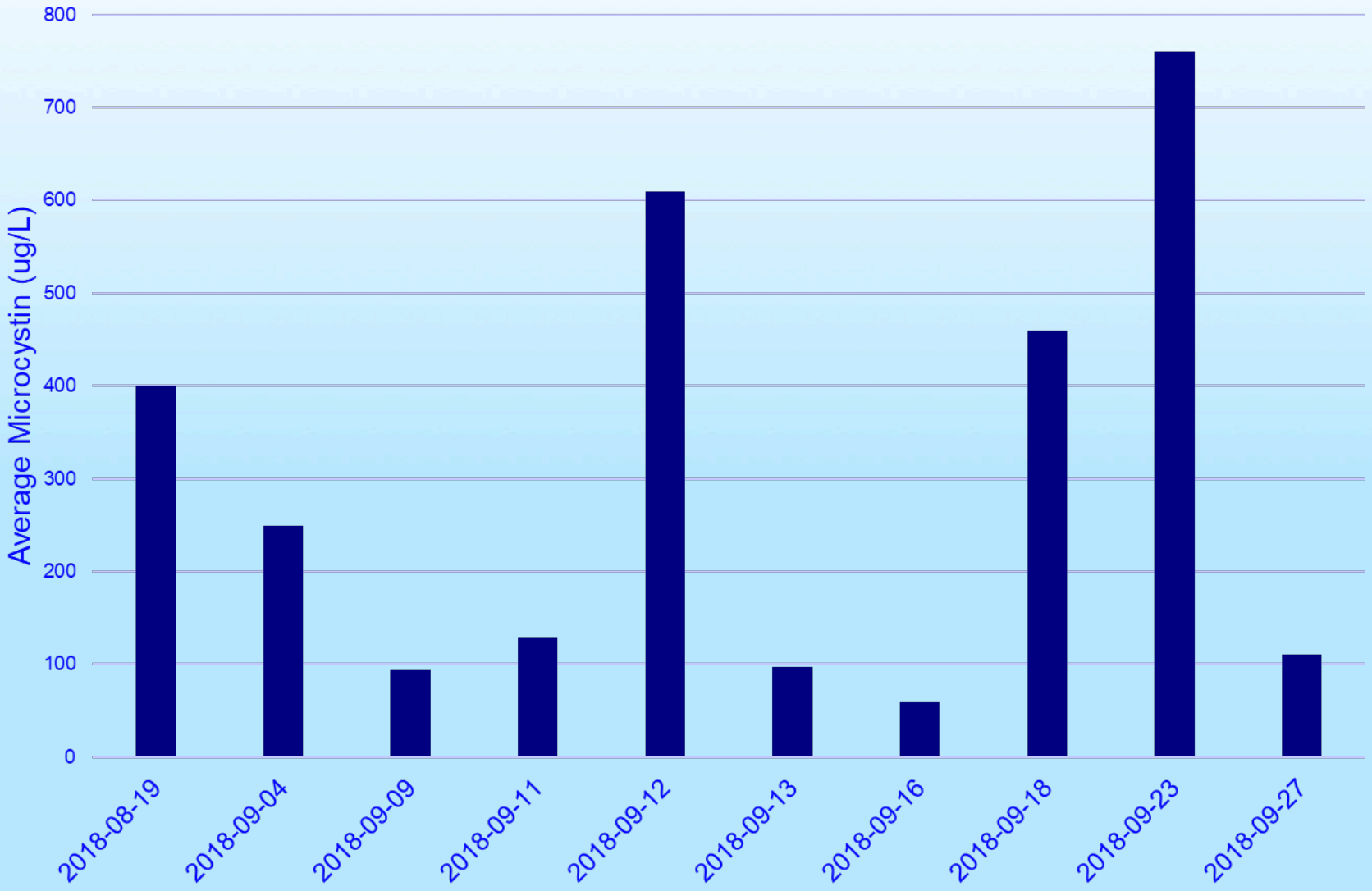
Valid Bloom Reports by Date



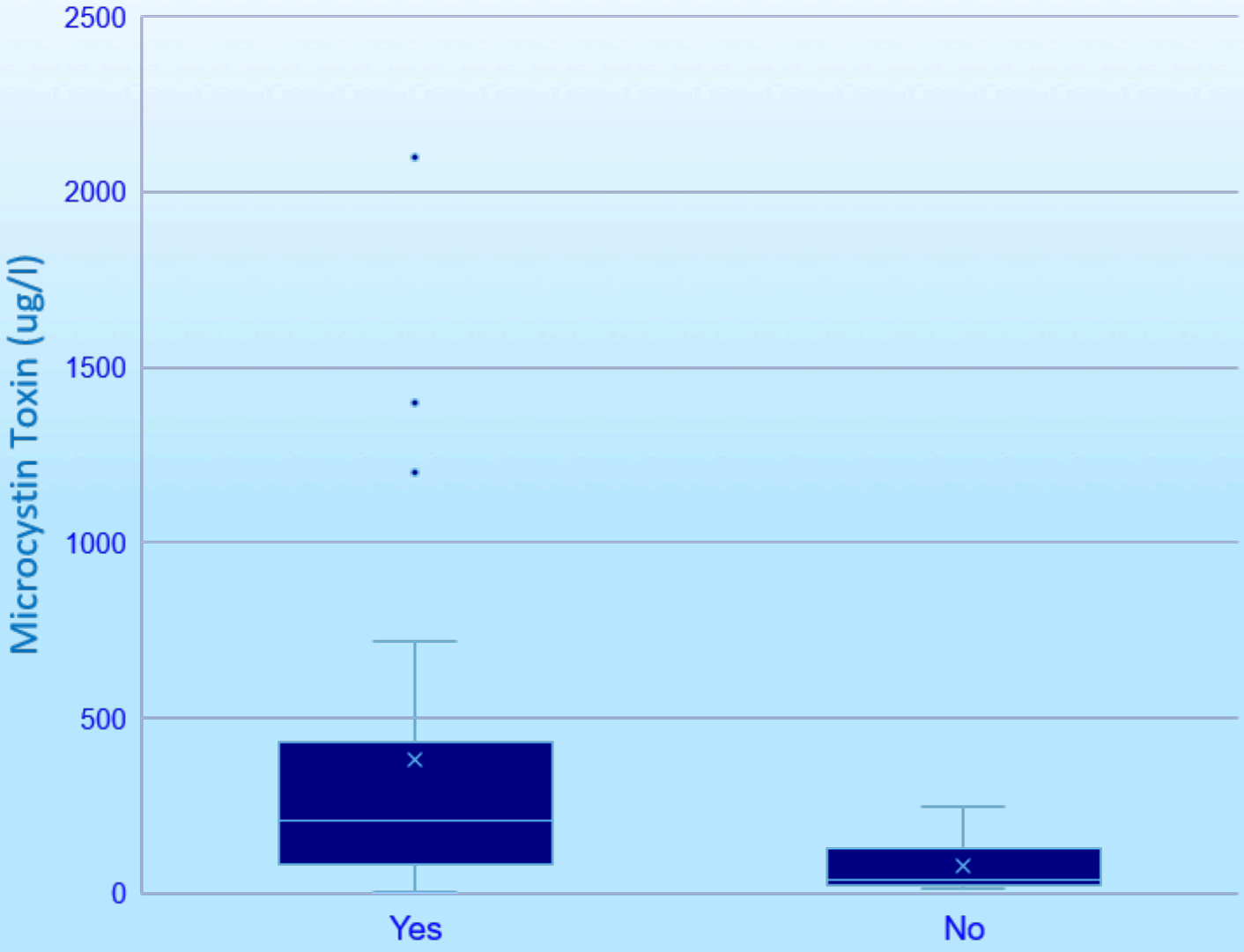
Average Blue-Green Chlorophyll by Date



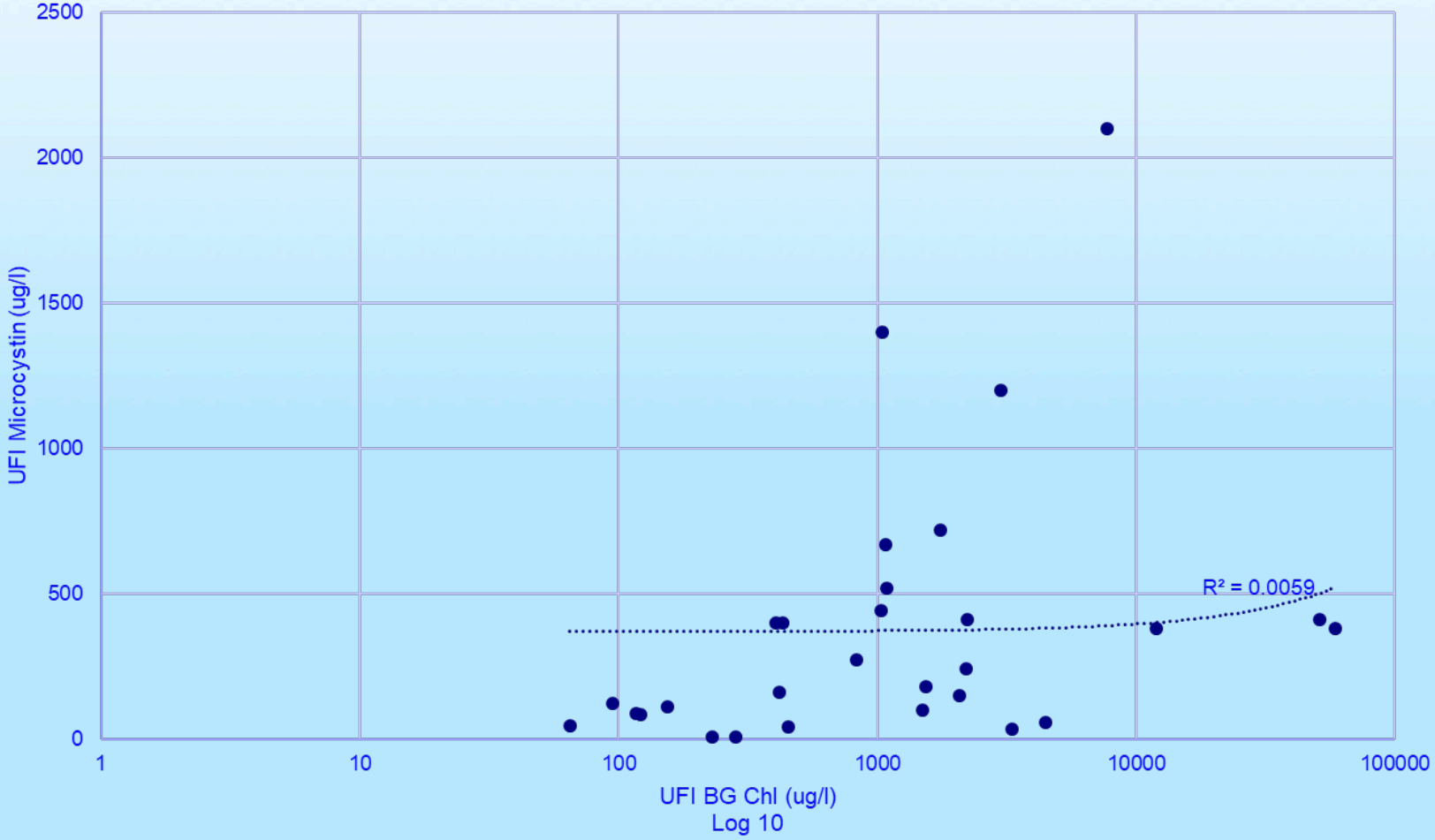
Average Microcystin by Date



Toxin and Microcystis Presence in Sample



UFI Microcystin and Blue-Green Chl Samples with Visual Microcystis Present



Small Toxic Bloom

This is the 9/27 bloom.

Very small…shoreline to 2 feet out.

More green cloud in the water than surface paint like appearance.

Sample analysis:

- 155 µg/L BG Chl
- 100 µg/L Microcystin

Where do we go from here?

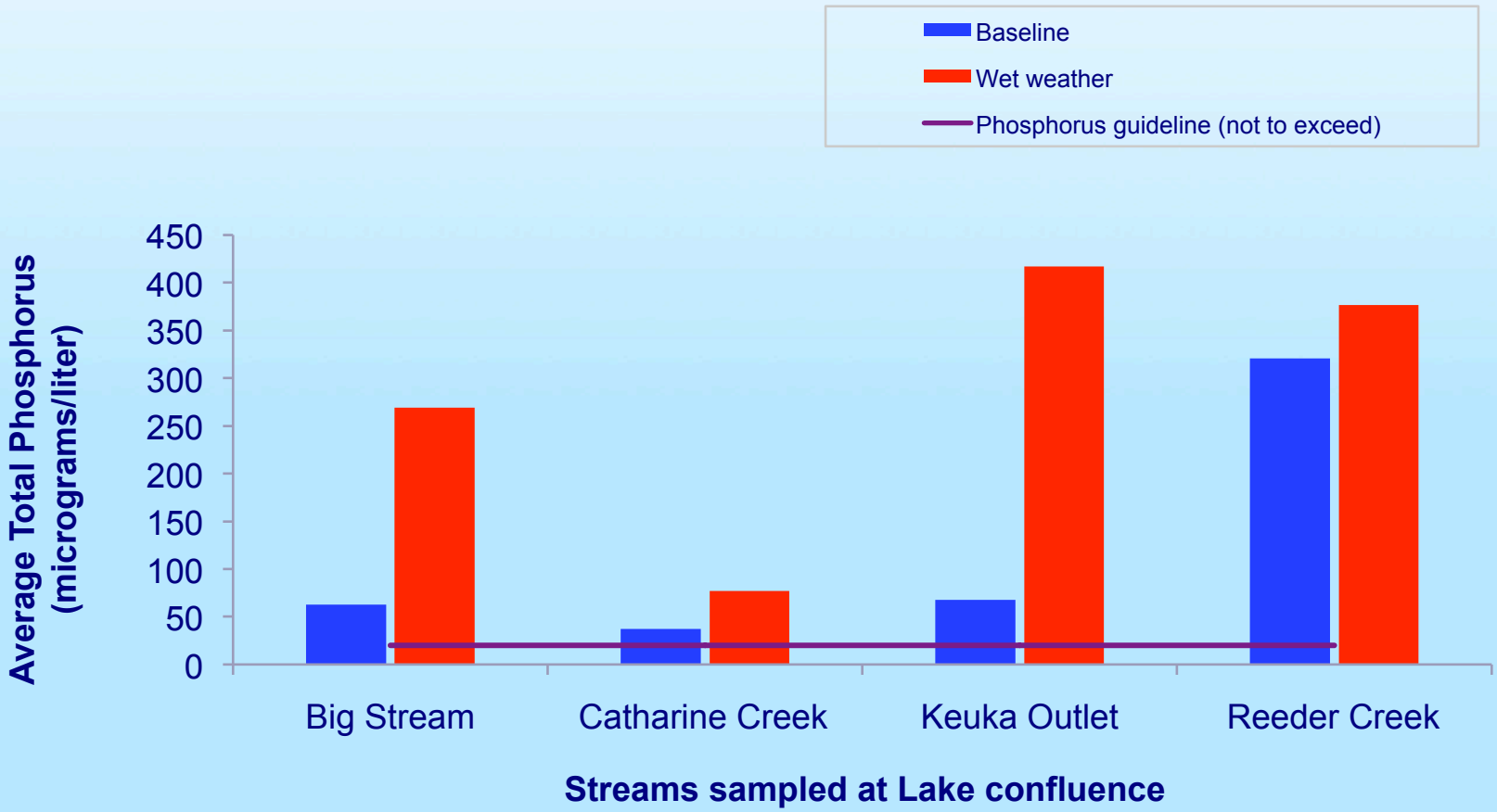
HABs Learnings From Other Studies

- Phosphorous is a critical nutrient stimulating blooms
- Nitrogen also important – can be generated from air and water as well as decaying plant matter
- Sunlight, water temperature and water conditions play a key role
- Some suggestions that blooms can be related to Zebra Mussels and Quagga Mussels
- Major storm events appear to be increasing due to Global Warming

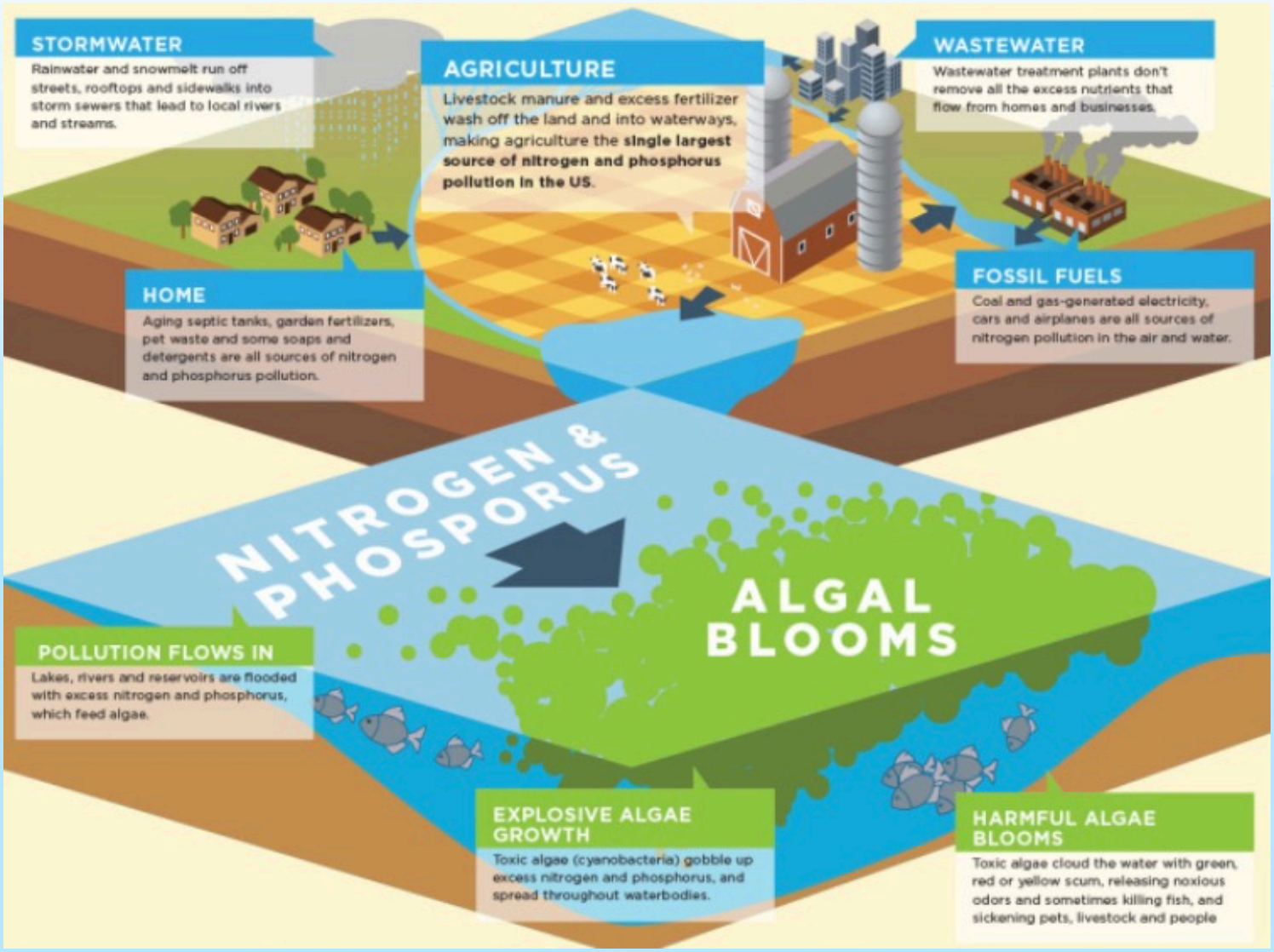
HABs Learnings From Our Stream Studies

- *Stream Teams* monitor the six largest streams flowing into our lake
- Stream data, at the mouth of the streams, show heavy concentrations of phosphorous during normal flow conditions
- During storm events, streams contain up to five times the phosphorous concentration as compared to normal flow

Stream Phosphorus Concentration Entering the Lake



Must Attack HABs Together



Conclusions

- Need to limit ALL sources of phosphorous into the lake!!
- Sources include soil erosion, agricultural runoff, waste water treatment plant effluent and septic tank effluents
- Cooperation required across all areas of community to address this problem

How You Can Help

- Reduce phosphorus
  - Home Septic System
  - Agriculture
  - WWTP
  - Erosion
- Help increase awareness
- Stay informed
- Become a volunteer
- Join the Seneca Lake Pure Waters Association

THANK YOU FOR YOUR HELP WITH HABs!!

Title Slide

Title

Text

- Outline Level 1
  - Outline Level 2
    - Outline Level 3
      - Outline Level 4

Title

Text

- Outline Level 1
  - Outline Level 2
    - Outline Level 3
      - Outline Level 4

Title – 2 Column Layout

Column

Column