

2020 HAB Recreational Response Strategy

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**Presented at:
NJ Water Monitoring Council Meeting**

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Overview

- HAB Preparedness and Capacity Building
- Governor's 2019 HABs Initiative
- Development of 2020 HAB Response Strategy
- 2020 HAB Alert Tiers
- Council HAB Partnership Recommendations

DEP HAB Websites:

<https://www.nj.gov/dep/hab/> and
<https://www.state.nj.us/dep/wms/bfbm/CyanoHABHome.html>

Need For State Preparedness for HAB Response

- Increasing global incidence & concern
- Human & animal health, ecosystem & economic impacts
- Human Health – recreational & drinking water exposure
- High profile blooms (e.g., Lake Erie, Ohio River, & Lake Okeechobee)
- Increasing HAB reports - EPA, USGS, & other states on National Water Quality Monitoring Council, Assoc. of Clean Water Admin's
- **NY** developed HAB response program in 2012

NJ HAB Response Preparedness

2012

- No HAB field monitoring methods/ equipment
- No cyanobacterial ID or cell count lab methods
- No HAB toxin lab methods or equipment
- No Advisory Guidance Levels
- No HAB website or outreach materials
- No State Response Strategy

NJ HAB Response Capacity Building

2007/2012

Sample Collection for EPA's **National Lakes**

Assessment - microcystins

2013

BFBM Freshwater Monitoring Lab – **microcystins ELISA analysis equipment** (*EPA Monitoring Initiative funds*)

Added microcystins analysis to **State Lake Survey Network**

2014 - Lab methods expanded - **anatoxin-a & cylindrospermopsin**



HAB Response Capacity Building (cont'd)

2015

Pilot monitoring -NJ State Parks (toxin test strips), Rutgers U, Montclair U

Enhanced Understanding of HAB science –DEP Division of Science & Research (DSR), EPA, USGS

Developed public HAB Fact Sheet - posted on Lakes Monitoring website

NJ Water Monitoring Council (NJWMC) – HABs session -
Presenters: NYSDEC, EPA, USGS, Montclair U.



HAB Response Capacity Building (cont'd)

2016

NYDEC and NYDOH input on HAB program

Convened NJ Interagency HAB Workgroup –

Dept. of Environ. Protection (DEP) – multiple programs

Dept. of Health (DOH)

Dept. of Agriculture (DOA)

Drafted NJ Response Strategy

HAB Response Capacity Building (cont'd)

2017

Final toxin thresholds -DEP Division of Science & Research

Recreational Exposure & Health Effects Fact Sheet

Final Strategy released & HAB Website launched (8/17)

NJ Strategy added to EPA HAB State Resources webpage

Outreach - Parks & local health agencies

Responded to 30 reported HABs

NJ HAB Response Preparedness (cont'd)

2012-2017

DEP proactively developed HAB response capabilities

Using continued input, review & enhancement:

- Scientific literature
- **NJ Water Monitoring Council**
- DOH
- EPA, USGS
- Other states & national organizations –
 - National Water Quality Monitoring Council
 - Assoc. of Clean Water Administrators (ACWA)
- Stakeholder and public meetings

- Developed 1st HAB Recreational Response Strategy - 2017

Governor's November 2019 HABs Initiative

Harmful Algal Blooms (HABs) Initiative

Harmful Algal Blooms are a global phenomenon and have impacted lakes and beaches nationwide. New Jersey is taking proactive approaches to prevent HABs, develop treatments, enhance science and communicate risks.

Take Action to Prevent and Mitigate HABs

\$2.5 M in HAB/Lakes Management Grants

As an element of its nonpoint pollution grant funding, the New Jersey Department of Environmental Protection will issue a request for proposals for \$2.5 million in Lakes/HAB management matching grants, including for treatment and prevention projects. Grantees will be required to provide a 33% match to the State's investment resulting in a \$3.3 million investment in new projects to avoid/mitigate HABs.

\$1 M in Watershed Planning Grants

The DEP will make up to \$1 million of Watershed Nonpoint Source Grant funding available for planning and projects that reduce the nonpoint source pollution, including nutrients, that contribute to HABs in surface waters. A match will not be required but will improve the project ranking.

\$10 M in Principal Forgiveness

The DEP will offer \$10 million in principal forgiveness grants from Clean Water State Revolving Fund for half of the cost (up to \$2 million) per project of major infrastructure upgrades to reduce nutrient loading to waterbodies, including sewer and stormwater projects.

Enhance Science and Build Capacity to Respond

Build an Expert Team

The DEP will establish an expert HAB and lakes management team to:

- Evaluate and address prevention and mitigation strategies;
- Develop New Jersey HABs and Lakes Management Guidance Materials; and
- Provide local partners with technical assistance for development of local HAB action plans.

Science Agenda

- DEP will evaluate thresholds for different exposure pathways to cyanobacteria and toxins for humans and animals and establish guidance values for new toxins as needed.
- DEP will research HABs and prepare to use new monitoring and lab testing tools.
- DEP, in consultation with the expert panel, will build on existing efforts to develop a database of treatment technologies.

Build Statewide HAB Monitoring Program Capacity

DEP will pursue additional monitoring, laboratory testing and data management capacity both internally and with external partners to assess water quality conditions and sources that contribute to HABs and to inform HAB event response, prevention and treatment.



Improve Communication

Regional HAB Summits

DEP will host two regional summits (north and central/south) for the purpose of sharing and gathering information where experts, governmental officials, businesses and members of the public will gather to share information and expertise on treatment and mitigation of HABs.

Enhance Web Tools

- A new and improved HAB website, including updated scientific information.
- A new interactive HAB mapping app.

Assist Local Governments

- Provide municipalities with compliance assistance to help with stormwater and septic discharges compliance.
- Investigate facilities surrounding waterbodies to ensure compliance with discharge permits and identify facilities that are not permitted.
- Work with local government to map and maintain essential stormwater infrastructure.
- Assist locals to develop and implement long-term capital improvement plans to upgrade storm and sewer infrastructure.
- Help municipalities and local health agencies regarding risk communication and protection of ground water sources of potable water supply.



While at Lake Hopatcong, the DEP's Johannus Franken (Bureau of Freshwater and Biological Monitoring) and Commissioner Catherine R. McCabe discuss HAB sampling procedures.



As part of the HAB monitoring process, microbiologist Robert Newby, Ph.D., (Division of Science and Research) counts cells at a DEP lab.



Report a HAB

To report what could be a HAB in a lake, pond, river, or stream, call the NJDEP Hotline at 1-877-WARNDEP (927-6337) or download the free **WARN NJDEP mobile app** from iTunes, Google Play or Windows Phone.



For more information, please visit the NJDEP Harmful Algal Blooms website: www.nj.gov/dep/hab/



Enhance Science & Build Capacity to Respond

- Evaluate thresholds and guidance values – cyanobacteria & toxins
- New monitoring and testing tools
- Build DEP & external capacity – monitoring, lab testing & data management

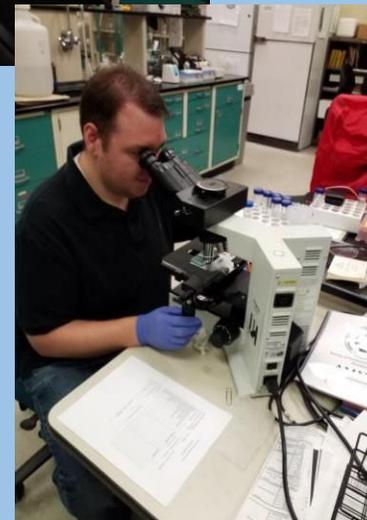
Improve Communication

- Improve HAB website
- Build interactive HAB reporting tool



HAB Strategy Development and 2020 Revisions

- Interagency Workgroup - initiated Strategy development in 2016, released in 2017, reviewed and enhanced through 2020
- 2020 Proposed Strategy revised by Interagency Workgroup and DEP HAB Task Force
- Workgroup
 - 7 DEP Programs (DWMS, DSR, WRM, DWSG, DPF, DFW, OQA)
 - 2 DOH Programs (EOHS – inc PRB - and Comm Disease)
 - 1 NJDOA Program (Animal Health)
- 4 Committees
 - Health Effects, Monitoring/Testing, Research and Communications



2020 HAB Strategy Development - External Input

- Greenwood Lake and Lake Hopatcong Commission Meetings (2)
- 2 HAB Summits – Pequest Natural Resource Education Center & Rutgers EcoComplex
- 2 NJ Water Monitoring Council HAB Technical Meetings (9/18/19 and 1/22/20)



ADVISORY GUIDANCE

LEVELS



Gov's HABs Initiative Strategy Needs	2018/19 Strategy	2020 Strategy
<p>Evaluate existing Advisory Guidance Levels – Cells count and 3 Toxins New Toxins</p>	<p>Cell count – 1 threshold ≥20,000 cells/mL 3 Toxins >3µg/L Microcystins >8 ug/l Cylindrospermopsin >27 ug/l Anatoxin</p>	<p>Cell Count – 3 thresholds ≥20,000, ≥40,000 (monitoring) and ≥80,000 cells/mL Toxins – Advisory toxin thresholds for toxins remain the same New Toxin in progress - Saxitoxin</p>
<p>Evaluate notification/ advisory tiers</p> <ul style="list-style-type: none"> Enhance alignment of advisory tiers w/expected adverse health responses Use new 2017-2019 NJ HAB Database 	<p>2 tiers – Warning (Suspected) Danger (Confirmed)</p>	<p>5 tiers - Watch – Suspected and Confirmed- Cell Count, toxins Alert – Cell Count (beach monitoring) Advisory – Cell Count, toxins Warning - microcystins Danger - microcystins</p>
<ul style="list-style-type: none"> Enhance communication Develop interactive mapping & reporting system 	<p>Division/Bureau HAB website: Monitoring, Testing, Strategy, Advisory Signs, Outreach factsheets HAB event reporting- Table by municipality usually w/o data</p>	<p>Comprehensive DEP HAB website - Expanded web presence -e.g. links to drinking water, prevention. New advisory signs. HAB event reporting - Interactive mapping tool by site or waterbody w/data</p>
<ul style="list-style-type: none"> Advance monitoring, lab testing, research & data management Enhance capacities - all areas 	<p>Limited advanced monitoring tools No DEP lab certification for Toxins No HAB database Capacities limited –internal & external</p>	<p>Advanced monitoring tools included DEP certification available for microcystins HAB database developed (2017-2019) Internal capacity enhancement? External Capacities – NJ Water Monitoring Council (NJWMC), CEHA, Watershed Assoc's</p>

Reminder: Why Cyanobacterial Cell ID's & Densities Are Important

- **Harmful algal bloom definition** – generally $\geq 20,000$ cyanobacterial cells per milliliter (ml)
- Blooms are variable – can **begin producing toxins** when not previously & dominant HAB species can change
- Individuals may have **different sensitivities** to exposures to cells
- Exposure to cells (without toxins) can cause **skin rashes, eye and ear irritation, mouth ulcers, vomiting and diarrhea, and fever**
- Such **symptoms can be of concern**, particularly when they occur in children.

Cyanobacterial Cell Counts

Cell Count (cells/ml)	Observation	Citation
$\geq 5,000$	Increased risk of mild irritative and allergenic effects.	Pilotto et al., 1997; cited by WHO (2003)
$\geq 20,000$	<ul style="list-style-type: none">• Defined as a bloom.• WHO guideline for irritative and allergenic effects.	<ul style="list-style-type: none">• USGS/Loftin et al. (2008)• WHO (2003)
$\geq 80,000$	Increased probability of microcystin concentration $> 3 \mu\text{g/L}$ (NJDEP guidance level)	BFBM and DSR analyses of NJ data

Review of Basis of Cyanotoxin Reference Doses

Division of Science and Research

- *Newer studies provide additional support for the microcystin and cylindrospermopsin Reference Doses. No new studies for anatoxin-a.*
- ***No revision to current DEP Reference Doses or Recreational Advisories***

Cyanotoxin	NJDEP Reference Dose (µg/kg/day)	NJDEP Criterion (µg/L)
<i>Microcystin-LR</i>	0.01	3
<i>Cylindrospermopsin</i>	0.03	8
<i>Anatoxin-a</i>	0.1	27
<i>Saxitoxin</i>	underway	underway

Tiered Microcystin Threshold Values

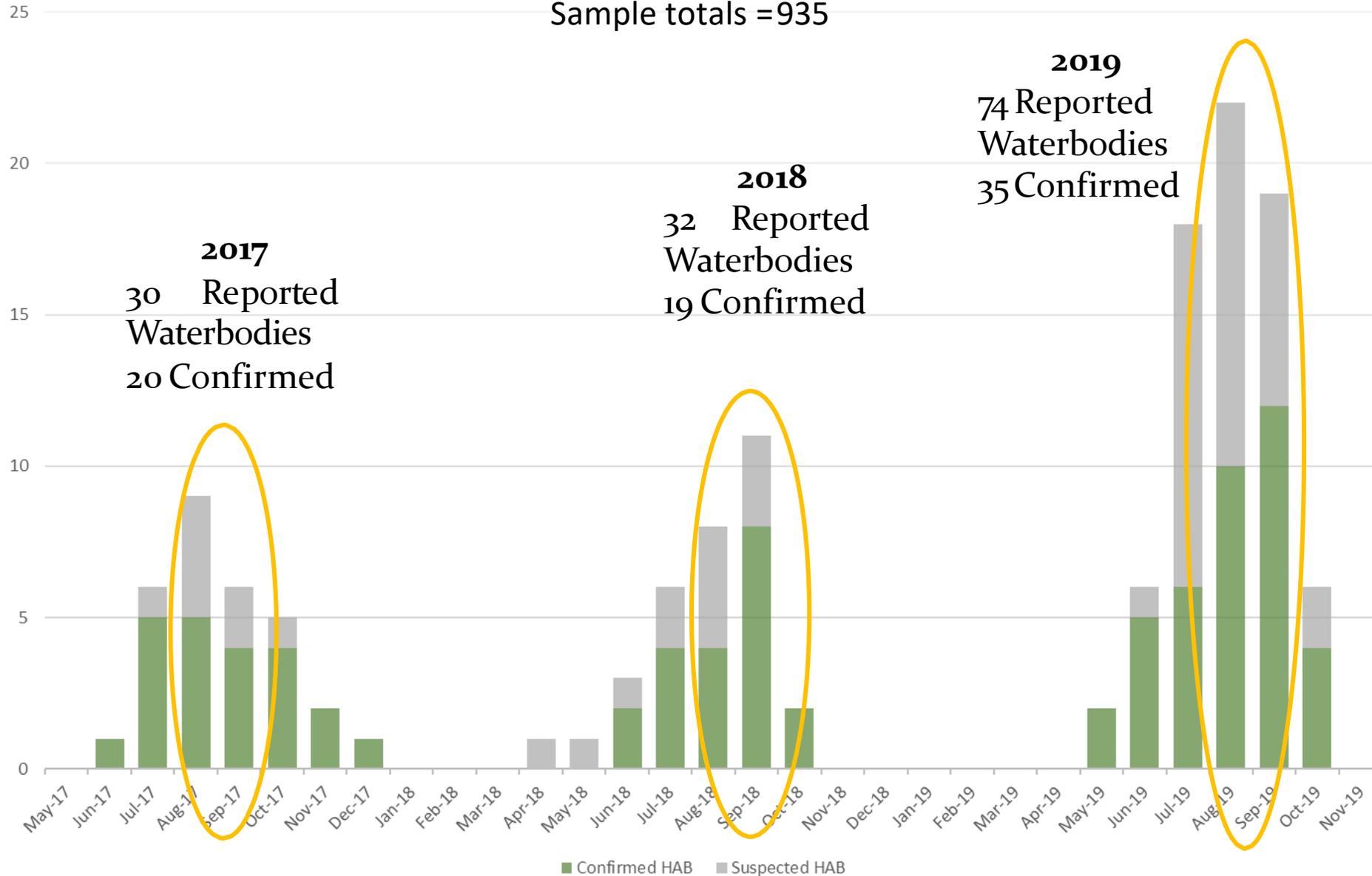
	Recreational Threshold Values
Advisory	3 µg/L
Warning (new)	20 µg/L (new) <ul style="list-style-type: none">• <i>California and Ohio “Danger” level; New York – “Confirmed with High Toxins Bloom”</i>• <i>WHO states that adult dose could be close to WHO TDI (Tolerable Daily Intake) and child dose could be 10-times WHO TDI.</i>• <i>USEPA (based on WHO) – “high relative probability of acute health effects.”</i>
Danger (new)	2,000 µg/L (new) <ul style="list-style-type: none">• <i>Kansas and Utah “Danger” level.</i>• <i>Child dose would be ~750 times the NJ Reference Dose and only ~5 times < dose causing toxicity in animal studies.</i>• <i>USEPA (based on WHO) – “very high relative probability of acute health effects.”</i>• <i>Based on USEPA screening analysis – Daily inhalation dose near a lake with 2,000 µg/L estimated as several-fold higher than NJDEP Reference Dose.</i>

NOTIFICATIONS/ ADISORY TIERS

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WATERBODIES WITH SUSPECTED HAB REPORTS CONFIRMED 2017-2019

Sample totals = 935



HAB Event Summary - 2019

- **35 Waterbodies** with confirmed HABs/ **74 responses** to suspected HAB reports
- **25 Bathing Beaches** (in season) at 6 waterbodies
 - 18 at Lake Hopatcong
 - 3 at Greenwood Lake
 - 4 other lakes
 - 17% of waterbodies w/ confirmed HABs
- **4 Drinking Water Sources**
 - 11% of waterbodies w/ confirmed HABs
 - Spruce Run, Canistear, Manasquan and Monksville

Spruce Run

- 1) Beach
- 2) Boat Launch
- 3) Watershed Office
- 4) Tower
- 5) Spillway
- 6) Campground

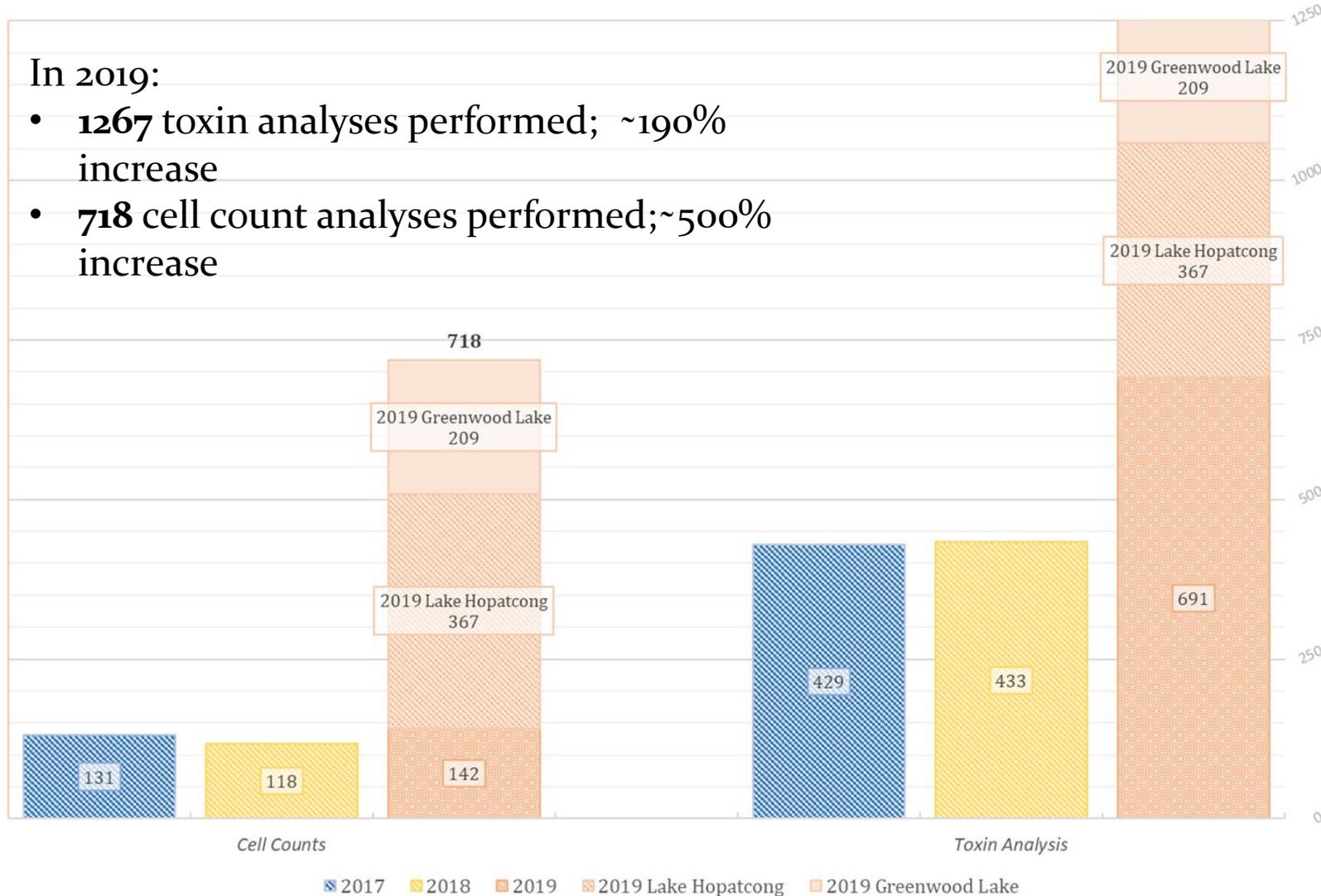


Significant Increase in HAB Sampling and Lab Data- Enables NJ HAB Database Development

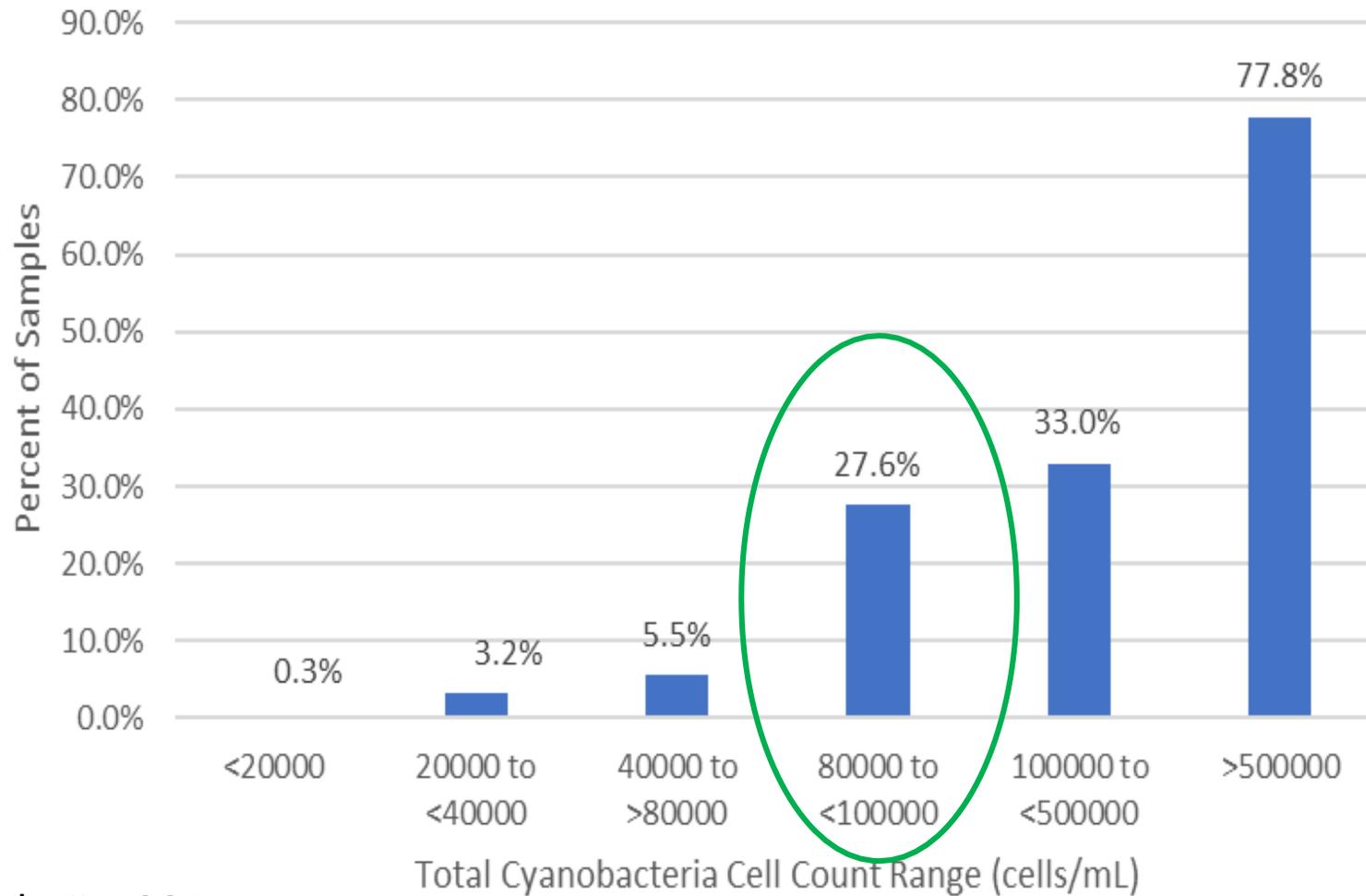
2017-2019 BFBM Response and Analysis

In 2019:

- **1267** toxin analyses performed; ~190% increase
- **718** cell count analyses performed; ~500% increase



Percent of Cyanobacteria Bloom Response Samples Exceeding 3ug/l of Microcystins Toxin 2017-2019 Data



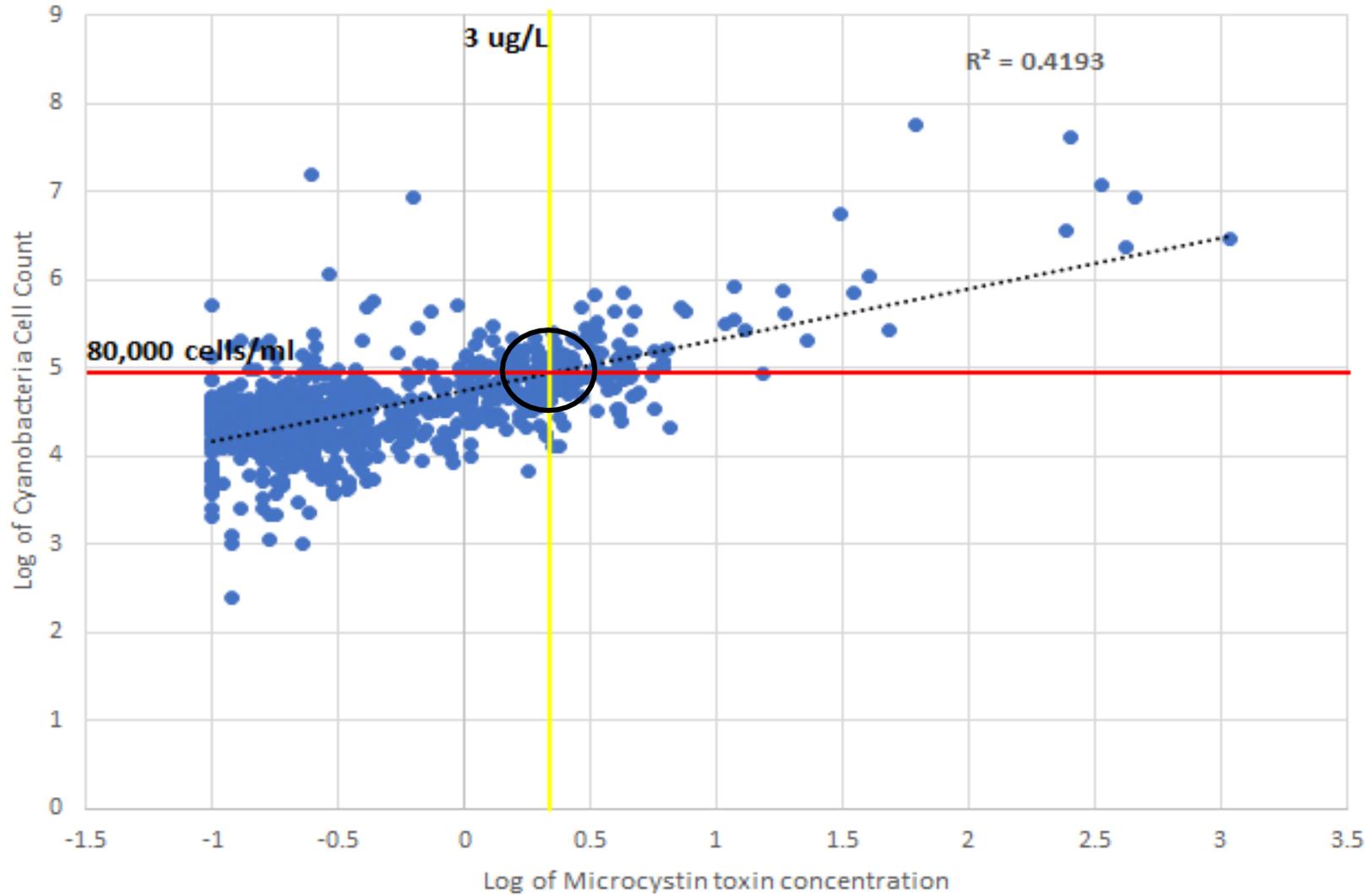
Sample # = 935

■ % of samples >= 3ug/l microcystin toxin



Relationship of Cell Counts to Microcystins

Log of Microcystin Toxin vs, Log of Cyanobacteria Cell Count



Robert Schuster, BMWWM



2020 HAB ALERT TIERS

HAB ALERT LEVEL	CRITERIA	RECOMMENDATIONS
NONE	No HAB present or reported.	None
WATCH <i>Suspected or confirmed HAB with potential for allergenic and irritative health effects</i>	Suspected HAB based on visual assessment or screening test OR Lab confirmed cell counts between 20k – 40k cells/mL AND No known toxins above public health thresholds	Public Bathing Beaches Open (dependent upon local health authority evaluation and assessment)
		Waterbody Accessible: ➤ Use caution during primary contact (e.g. swimming) and secondary (e.g. non-contact boating) recreational activities
		Do not ingest water (people/pets/livestock)
		Do not consume fish
ALERT <i>Confirmed HAB that requires greater observation due to increasing potential for toxin production</i> PUBLIC BATHING BEACHES INCREASE MONITORING	Lab confirmed cell counts between 40k – 80k cells/mL AND No known toxins above public health threshold	WATCH remains in effect.
		Public Bathing Beaches Open (dependent upon local health authority evaluation and assessment) and should observe and report changing bloom conditions
		Waterbody Accessible: ➤ Use caution during primary contact (e.g. swimming) and secondary (e.g. non-contact boating) recreational activities
		Do not ingest water (people/pets/livestock)
ADVISORY <i>Confirmed HAB with moderate risk of adverse health effects and increased potential for toxins above public health thresholds</i>	Lab testing for toxins exceeds public health thresholds OR Lab confirmed cell counts above 80K cells/mL OR Field measurement evidence indicating HAB present and above guidance thresholds (e.g. phycocyanin readings)	Public Bathing Beaches Closed
		Waterbody Remains Accessible: ➤ Avoid primary contact recreation (e.g. swimming) ➤ Use caution for secondary contact recreation (e.g. boating without water contact)
		Do not ingest water (people/pets/livestock)
		Do not consume fish
WARNING <i>Confirmed HAB with high risk of adverse health effects due to high toxin levels</i>	Toxin (microcystin) 20 - 2000 µg/l AND/OR Additional evidence, including, expanding bloom, increasing toxin levels (i.e. duration, spatial extent or negative human or animal health impacts) indicates that additional recommendations are warranted	Public Bathing Beaches Closed
		Waterbody Remains Accessible. ➤ Avoid primary contact recreation (e.g. swimming) ➤ May recommend against secondary contact recreation (e.g. boating without water contact) with additional evidence
		Do not ingest water (people/pets/livestock)
		Do not consume fish
DANGER <i>Confirmed HAB with very high risk of adverse health effects due to very high toxin levels</i>	Toxin (microcystin) > 2000 µg/l AND/OR Additional evidence, including, expanding bloom, increasing toxin levels (i.e. duration, spatial extent or negative human or animal health impacts) indicates that additional recommendations are warranted	Closure of Public Bathing Beaches
		Possible closure of all or portions of waterbody and possible restrictions access to shoreline.
		Avoid primary contact recreation (e.g. swimming) May recommend against secondary contact recreation with additional evidence
		Do not ingest water (people/pets/livestock) Do not consume fish

Beach monitoring tier

WATCH

HAB Alert Level	Criteria	Recommendations
<p>WATCH</p> <p><i>Suspected or confirmed HAB with potential for allergenic or irritative health effects</i></p>	<p>Suspected HAB based on visual assessment or screening test</p> <p>OR</p> <p>Lab confirmed cell counts between 20K-40K cells/mL</p> <p><u>AND</u></p> <p>No known toxins above public health thresholds</p>	<p>Public Bathing Beaches open (dependent upon local health authority evaluation and assessment)</p> <p>Waterbody Accessible:</p> <ul style="list-style-type: none">➤ Use caution during primary contact (e.g., swimming) and secondary (e.g., no contact boating) recreational activities <p>Do not ingest water (people/pets/livestock)</p> <p>Do not consume fish</p>

ALERT (Beach Monitoring Tier)

HAB Alert Level	Criteria	Recommendations
<p>ALERT</p> <p><i>Confirmed HAB that requires greater observation due to increasing potential for toxin production</i></p> <p>PUBLIC BATHING BEACHES- INCREASE MONITORING</p>	<p>Lab confirmed cell counts between 40K-80K cells/mL</p> <p><u>AND</u></p> <p>No known toxins above public health threshold</p>	<p>WATCH remains in effect</p> <p>Public Bathing Beaches open (dependent upon local health authority evaluation and assessment) and should observe and report changing bloom conditions</p> <p>Waterbody Accessible:</p> <ul style="list-style-type: none">➤ Use caution during primary contact (e.g., swimming) and secondary (e.g., no contact boating) recreational activities <p>Do not ingest water (people/pets/livestock)</p> <p>Do not consume fish</p>

ADVISORY

HAB Alert Level	Criteria	Recommendations
<p>ADVISORY</p> <p><i>Confirmed HAB with <u>moderate risk of adverse health effects</u> and increased potential for toxins above public health thresholds</i></p>	<p>Lab testing for toxins exceeds public health thresholds <u>OR</u></p> <p>Lab confirmed cell counts above 80K cells/mL <u>OR</u></p> <p>Field measurement evidence indicating HAB present and above guidance thresholds (e.g., phycocyanin readings)</p>	<p>Public Bathing Beaches closed</p> <p>Waterbody Remains Accessible:</p> <ul style="list-style-type: none"><li>➤ Avoid primary contact (e.g., swimming)<li>➤ Use caution for secondary contact recreation (e.g., boating without water contact) <p>Do not ingest water (people/pets/livestock)</p> <p>Do not consume fish</p>

WARNING

HAB Alert Level	Criteria	Recommendations
<p>WARNING</p> <p><i>Confirmed HAB with high risk of adverse health effects due to high toxin levels</i></p>	<p>Toxin (microcystin) 20-2000 µg/L</p> <p><u>AND/OR</u></p> <p>Additional evidence including expanding bloom, increasing toxin levels (i.e., duration, spatial extent or negative human or animal health impacts) indicates that additional recommendations are warranted</p>	<p>Public Bathing Beaches closed</p> <p>Waterbody Remains Accessible:</p> <ul style="list-style-type: none"><li>➤ Avoid primary contact (e.g., swimming)<li>➤ May recommend against secondary contact recreation (e.g., boating without water contact) with additional evidence <p>Do not ingest water (people/pets/livestock)</p> <p>Do not consume fish</p>

DANGER

HAB Alert Level	Criteria	Recommendations
<p>DANGER</p> <p><i>Confirmed HAB with very high <u>risk of adverse health effects</u> due to very high toxin levels</i></p>	<p>Toxin (microcystin) >2000 µg/L</p> <p><u>AND/OR</u></p> <p>Additional evidence including expanding bloom, increasing toxin levels (i.e., duration, spatial extent or negative human or animal health impacts) indicates that additional recommendations are warranted</p>	<p>Closure of Public Bathing Beaches</p> <p>Possible closure of all or portions of waterbody and possible restrictions of access to shoreline</p> <p>Avoid primary contact recreation (e.g., swimming)</p> <p>May recommend against secondary contact recreation with additional evidence</p> <p>Do not ingest water (people/pets/livestock)</p> <p>Do not consume fish</p>

ENHANCE COMMUNICATION



Gov's HABs Initiative Strategy Needs	2018/19 Strategy	2020 Strategy
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2018/2019 Advisory Signs

WATERBODY: <http://www.nj.gov/dep/wms/HABS.html> 

WARNING

**SUSPECTED
HARMFUL ALGAE BLOOM (HAB)
PRESENT**

WARNING - Avoid Contact or Ingestion (Humans and Animals)
*A Harmful Algal Bloom is suspected which can be harmful to humans and animals.
People, pets, and livestock should avoid contact and drinking the water.
Avoid swimming, wading, and watersports.
Fish caught in this waterbody should not be eaten.*

POSTED BY: _____

Suspected HAB

WATERBODY: www.nj.gov/dep/wms/HABS.html 

DANGER

HARMFUL ALGAE BLOOM (HAB) PRESENT
HIGH RISK-NO Contact or Ingestion (Humans and Animals)

**A confirmed Harmful Algal Bloom is present with levels
quantified at or above the NJ Health Advisory Guidance.**
*Do not drink or have contact with the water including, but not limited to, swimming, wading and watersports.
Fish caught in this waterbody should not be eaten.
Pets and livestock should not contact or drink the water.*

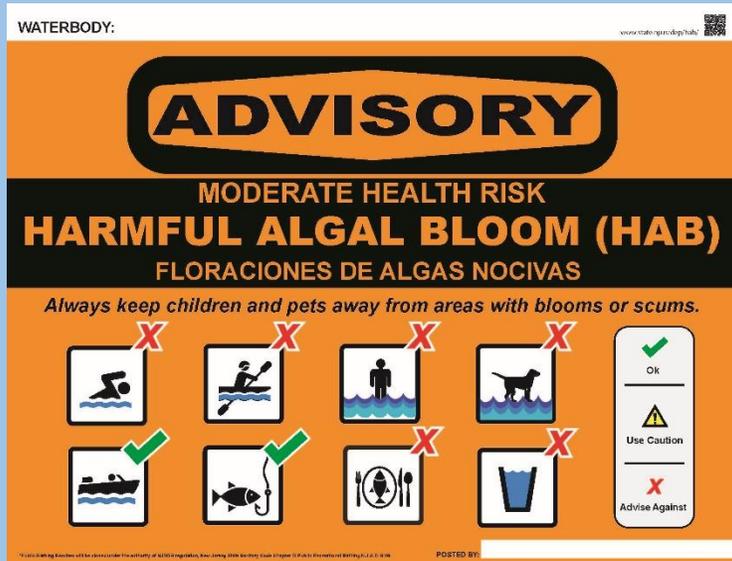
      

POSTED BY: _____

Greater than 20,000 cells/mL or 3 µg/L

2020 Advisory Signs*

- $\geq 20,000$ -80,000 cells/ml AND
- Toxins below thresholds
- Beaches open (dependent upon Local Health Authority)



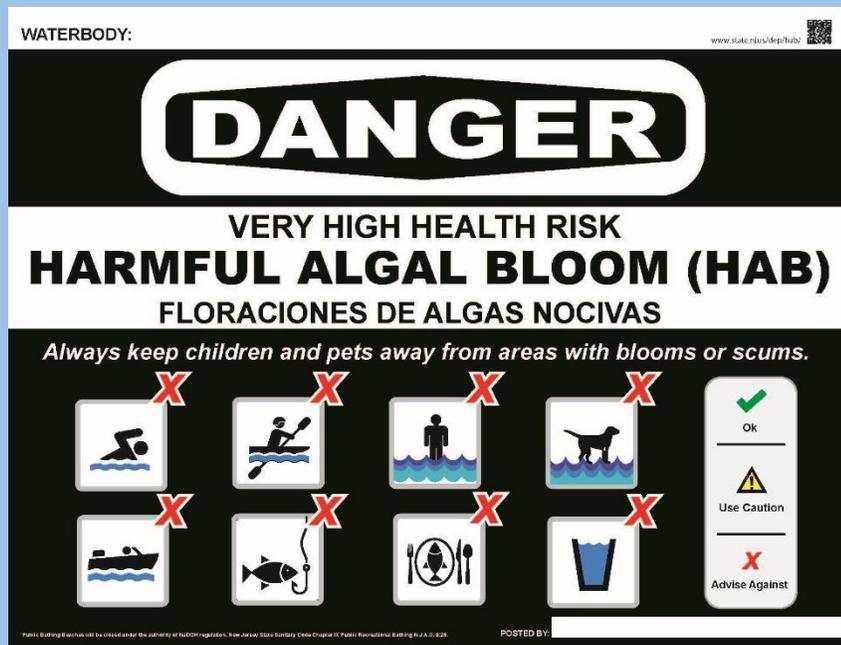
- $\geq 80,000$ cells/ml OR
- $> 3 \mu\text{g/L}$ (microcystins)
- $> 8 \mu\text{g/L}$ (cylindrospermopsins)
- $> 27 \mu\text{g/L}$ (anatoxin-a)
- Beaches closed
- Advice on primary recreation (e.g., Swimming, kayaking)

* Beach Closure sign will also be provided



2020 Advisory Signs (cont)

- 20-2000 $\mu\text{g}/\text{L}$ (microcystins)
- Beaches closed
- May include advice on secondary recreation - boating/fishing



- >2000 $\mu\text{g}/\text{L}$ (microcystins)
- Beaches closed
- Access to portions of or entire waterbody may be prohibited

BEACH CLOSED

PLAYA CERRADA

HARMFUL ALGAL BLOOM (HAB)

No Swimming • No Wading

FLORACIONES DE ALGAS NOCIVAS No nadar • No vadear

Contact can make people and animals sick.

El contacto puede enfermar a personas y animales.



www.state.nj.us/dep/hab/

*Public Bathing Beaches are closed under the authority of NJDOH regulation, New Jersey State Sanitary Code Chapter IX Public Recreational Bathing N.J.A.C.8:26.

POSTED BY:

New DEP HAB Interactive Map Reporting and Communication System* -

Replaces HABs Event Table

*Demo to come

NJDEP Algal Bloom Sampling Status

Samples By Date

- 6/1/2020, 10:09 AM Mountain Lake
- 6/1/2020, 10:04 AM Mountain Lake
- 6/1/2020, 8:43 AM Lake Hopatcong
- 5/28/2020, 10:52 AM Rosedale Lake
- 5/27/2020, 10:21 AM Lake Hopatcong
- 5/27/2020, 9:49 AM Lake Hopatcong
- 5/27/2020, 8:24 AM Lake Papaiani
- 5/18/2020, 9:32 AM Mountain Lake

In the case of multiple samples within a waterbody, the sample with the most protective Alert Level applies.

Use dropdown to view samples at a waterbody All Waterbodies

HAB Alert Level	Criteria	Recommendations
HAB Not Present	HAB reported and investigated. No HAB present.	None
WATCH <i>Suspected or confirmed HAB with potential for allergenic or irritative health effects</i>	Suspected HAB based on field survey OR Confirmed cell counts: $\geq 20K$ - $< 80K$ cells/mL AND No known toxins above public health thresholds	Public Bathing Beaches Open Waterbody Accessible: Use caution during primary contact (e.g. swimming) and secondary (e.g. non-contact boating) activities Do not ingest water (people/pets/livestock) Do not consume fish
ADVISORY <i>Confirmed HAB with moderate risk of adverse health effects, and increased potential for toxins above public health thresholds</i>	Lab testing for toxins: Microcystins: ≥ 3 $\mu\text{g/L}$ Cylindrospermopsin: ≥ 8 $\mu\text{g/L}$ Arietoxins: ≥ 27 $\mu\text{g/L}$ OR Confirmed cell counts: $\geq 80K$ cells/mL	Public Bathing Beaches Closed Waterbody Remains Accessible: Avoid primary contact recreation Use caution for secondary contact recreation Do not ingest water (people/pets/livestock) Do not consume fish
WARNING <i>Confirmed HAB with high risk of adverse health effects due to high toxin levels</i>	Toxin (microcystins) ≥ 20 - < 2000 $\mu\text{g/L}$	Public Bathing Beaches Closed Cautions as above May recommend against secondary contact recreation
DANGER <i>Confirmed HAB with very high risk of adverse health effects due to very high toxin levels</i>	Toxin (microcystins) ≥ 2000 $\mu\text{g/L}$	Public Bathing Beaches Closed Cautions as above. Possible closure of all or portions of waterbody and possible restrictions access to shoreline.

HAB Alert Levels: Watch Advisory Warning Danger

HAB Alert Level Overall Distribution

Thank you for using the NJDEP Algal Bloom Sampling Status Dashboard.

Map reflects sampling results for suspected or confirmed HAB events reported to DEP; there may be other HABs occurring in NJ not shown here.

This product is best viewed in Google Chrome at 100% zoom level.

This application is updated each day at noon.

Please submit questions or comments regarding this system to:
habsystem@dep.nj.gov

Links for more information:

- Bureau of Freshwater & Biological Monitoring HAB Website
- Advisory Guidance
- Response Strategy
- Outreach Materials
- Report a Suspected HAB

MONITORING, LAB & RESEARCH

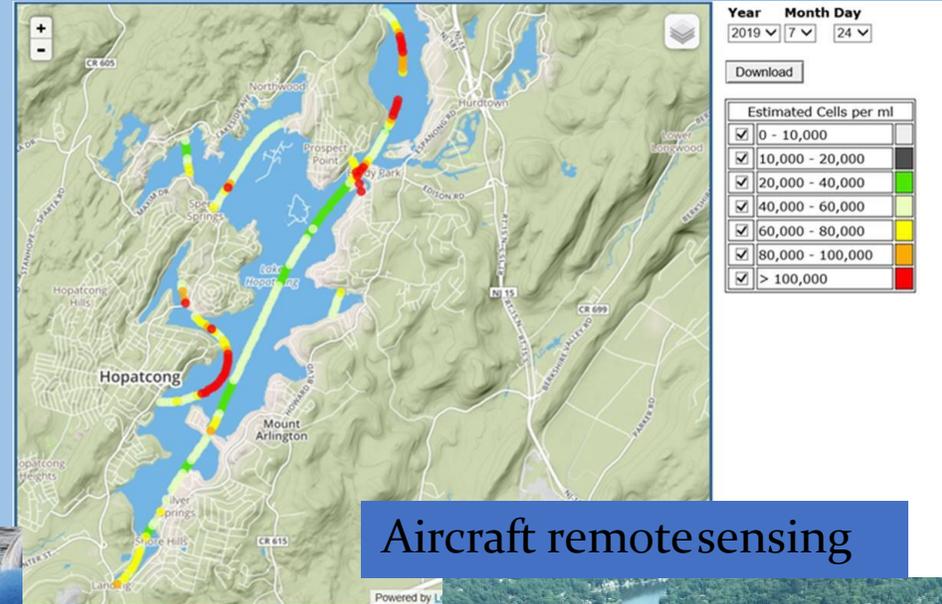


Gov's HABs Initiative Strategy Needs	2018/19 Strategy	2020 Strategy
<p>Evaluate existing Advisory Guidance Levels – Cells count and 3 Toxins New Toxins</p>	<p>Cell count – 1 threshold ≥20,000 cells/mL 3 Toxins >3µg/L Microcystins >8 ug/l Cylindrospermopsin >27 ug/l Anatoxin</p>	<p>Cell Count – 3 thresholds ≥20,000, ≥40,000 (monitoring) and ≥80,000 cells/mL Toxins – Advisory toxin thresholds for toxins remain the same New Toxin in progress - Saxitoxin</p>
<p>Evaluate notification/ advisory tiers</p> <ul style="list-style-type: none"> Enhance alignment of advisory tiers w/expected adverse health responses Use new 2017-2019 NJ HAB Database 	<p>2 tiers – Warning (Suspected) Danger (Confirmed)</p>	<p>5 tiers - Watch – Suspected and Confirmed- Cell Count, toxins Alert – Cell Count (beach monitoring) Advisory – Cell Count, toxins Warning - microcystins Danger - microcystins</p>
<ul style="list-style-type: none"> Enhance communication Develop interactive mapping & reporting system 	<p>Division/Bureau HAB website: Monitoring, Testing, Strategy, Advisory Signs, Outreach factsheets HAB event reporting- Table by municipality usually w/o data</p>	<p>Comprehensive DEP HAB website - Expanded web presence -e.g. links to drinking water, prevention. New advisory signs. HAB event reporting - Interactive mapping tool by site or waterbody w/data</p>
<ul style="list-style-type: none"> Advance monitoring, lab testing, research & data management Enhance capacities - all areas 	<p>Limited advanced monitoring tools No DEP lab certification for Toxins No HAB database Capacities limited –internal & external</p>	<p>Advanced monitoring tools included DEP certification available for microcystins HAB database developed (2017-2019) Internal capacity enhancement? External Capacities – NJ Water Monitoring Council (NJWMC), CEHA, Watershed Assoc's</p>

DEP Use of Advanced Technology for HABs Monitoring & Testing



Hand-held phycocyanin meters

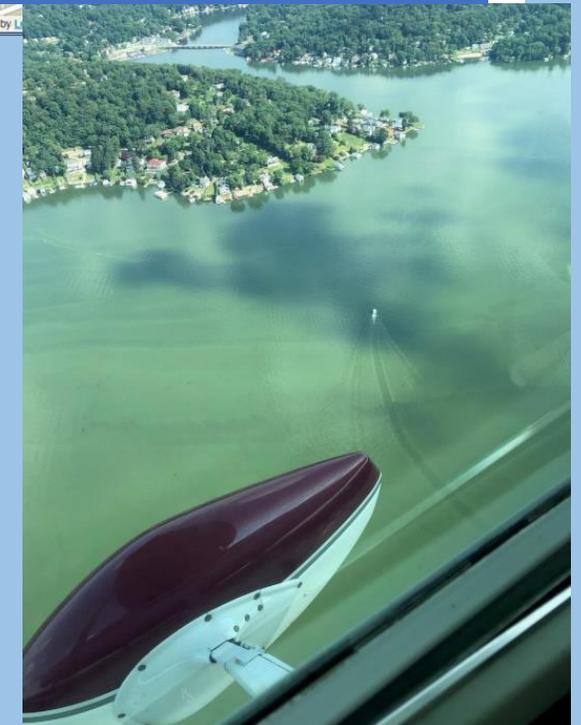


Aircraft remote sensing

qPCR – molecular testing for toxin production potential

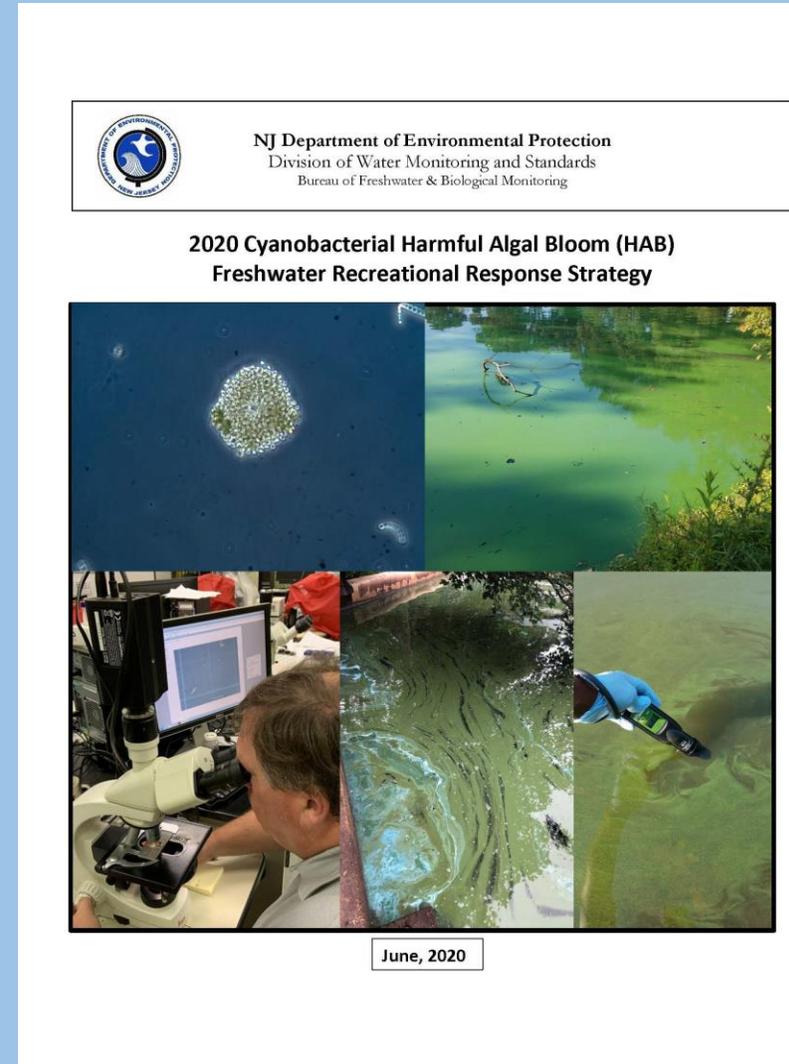


Continuous monitoring buoys



Summary of Key 2020 Proposed Strategy Revisions

- Data and science-driven enhancements with interested party, public & NJWMC input
- Five alert tiers (one monitoring tier) vs two tiers
- Better alignment between advisory tiers and potential adverse health risks, including increased focus on toxins
- Improved communication through:
 - Clearer signs, including activities that are ok to do (e.g., boating)
 - Interactive mapping tool
- Enhanced application of advanced monitoring tools



2020 HAB Actions to Date (as of 6/18/20)

37 - Site Surveys

7 – waterbodies w/ new suspected HAB reports

7 – status of 2019 waterbodies w/HABs persisting into 2020

31 - Cell count analyses

57 – Toxin analyses

2020 Alert Level Status

37.5% - **HAB not present**

6.25% - **Watch**

56.25% - **Advisory** (1 Beach Closure)



DEP HAB Strategy-related Press Releases

- HAB Alert Tiers – 5/21/20
- 2020 HAB Strategy and Interactive Mapping and Reporting System – 6/23/20
- Available at: <https://www.nj.gov/dep/newsrel/>

Strategy Implementation: Selected Council Partnership Recommendations

- Report HABs via DEP HAB System
- Provide surveillance and screening (inc. **Beach Alert** level)
- Fill gaps in sampling and sample transport to BFBM HAB lab
- Provide opportunities/venues for HABs training
- Assist in refining screening tools (e.g., phycocyanin meters)
- Conduct comparable laboratory cell counts and toxin analyses
- Provide HAB monitoring data to DEP for inclusion in HAB database
- Assist in evaluating existing HAB monitoring data set