Welcome to *The Current*, the North Central Region Water Network's Speed Networking Webinar Series

Beach Monitoring Practices, Outreach and Tools: 2pm CT

Submit your questions for presenters via the Q&A panel. There will be a dedicated Q&A session following the last presentation. The Q&A panel can be found via the Q&A icon at the bottom of the webinar screen.

If you are experiencing technical issues or have questions about the North Central Region Water Network or *The Current* Webinar Series, please use the chat feature. The chat feature is accessible via chat icon at the bottom of the webinar screen.

A phone-in option can be accessed by clicking the up arrow on the mute icon and clicking 'Switch to Phone Audio'.

This session will be recorded and available at northcentralwater.org.

Follow us:

Join our Listserv: ncrwater+subscribe@g-groups.wisc.edu

Today's Presenters:

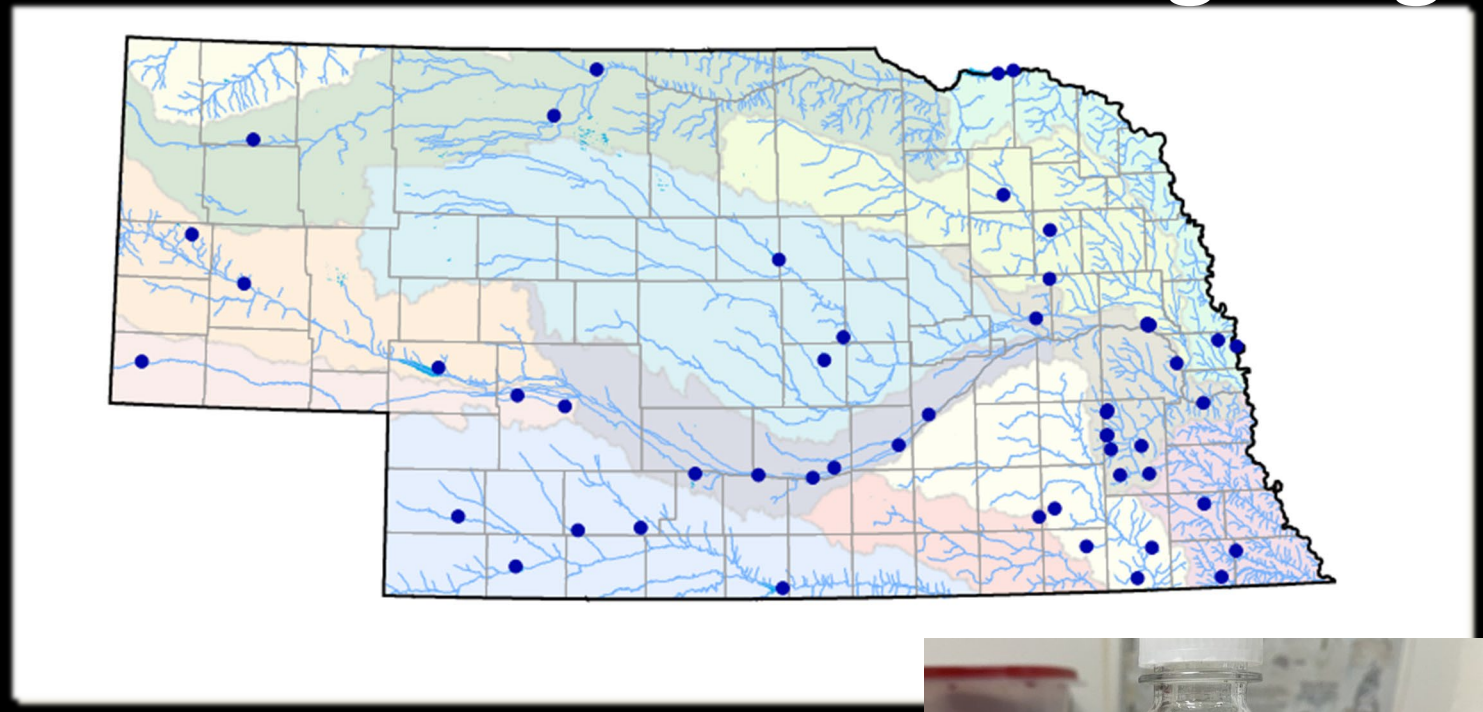
- **Mike Archer**, State Lakes Coordinator, Nebraska Department of Environment and Energy
- **Sara Hudson**, Director, City of Ashland Parks and Recreation Department
- **Nate Bosch**, Professor, Grace College, and Director, Lilly Center for Lakes & Streams
- **Sharon Frey**, Environmental Protection Specialist, Office of Science and Technology, Office of Water, US EPA

Mike Archer

Mike Archer is the State Lakes Coordinator for the Nebraska Department of Environment and Energy. He received a Bachelor's Degree in Biology from the University of Nebraska Kearney and a Masters Degree in Aquatic Ecology from the University of Nebraska Lincoln. Mike has worked for NDEE since 2012 where he oversees the Public Beach Monitoring Program and the Ambient Lake Monitoring Program, as well as working on numerous lake rehabilitation and construction projects as part of the agency's non-point source pollution program.

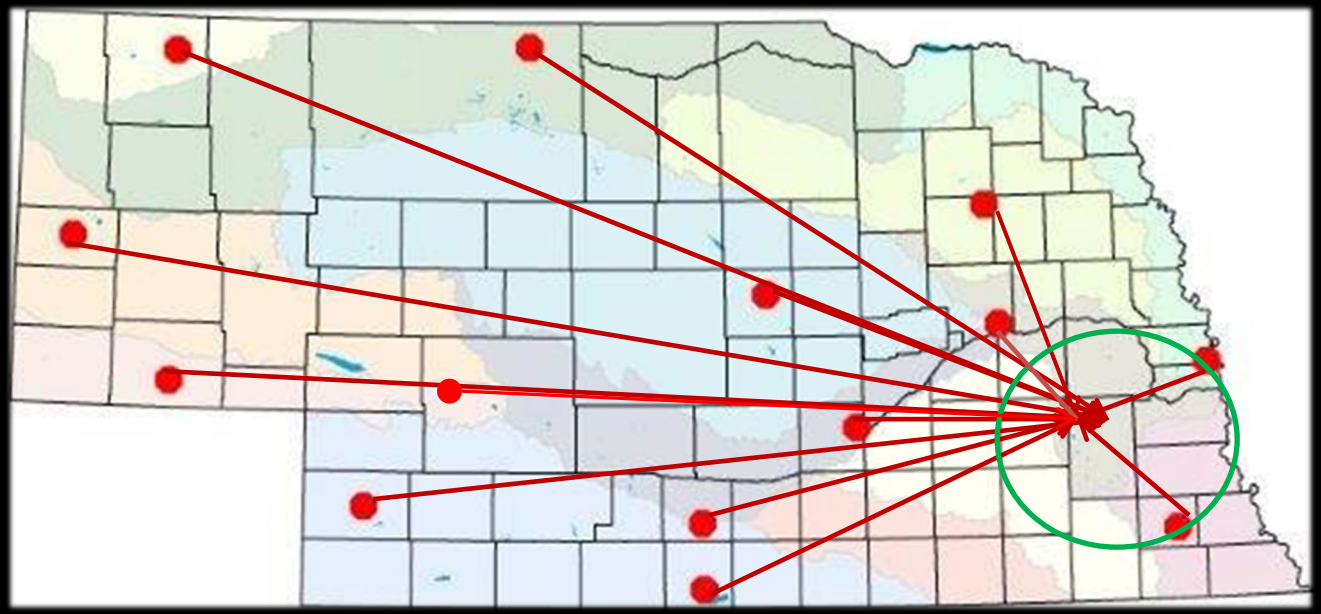
Nebraska Department of Environment and Energy
Public Beach Monitoring Program

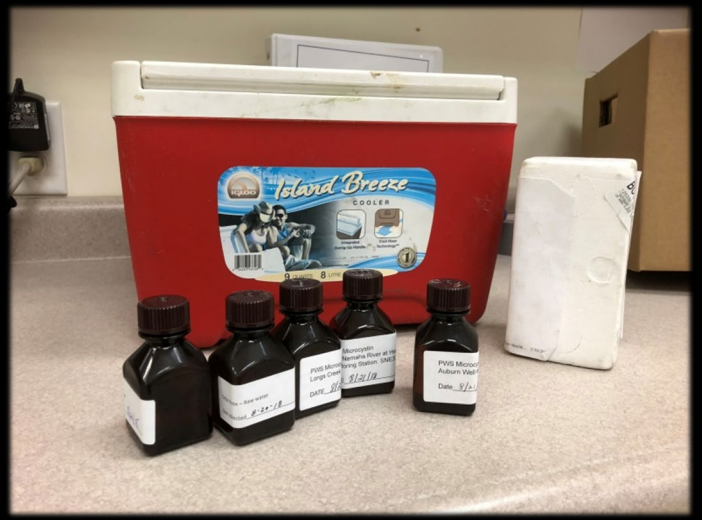
NDEE Public Beach Monitoring Program



- 53 Lakes (56 Beaches)
- Sampled Weekly
- May 1 – September 30
- 2 Human Health Parameters
  - *E. coli* Bacteria
  - Microcystin

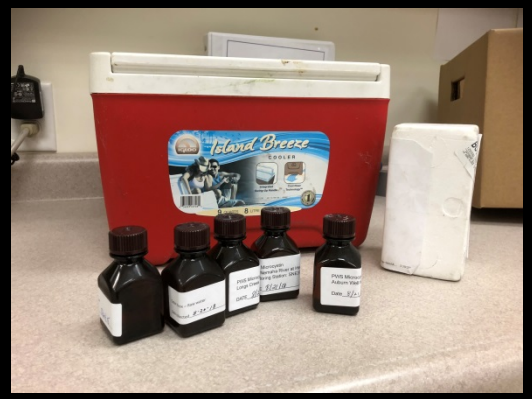
NDEE Public Beach Monitoring Program





- 10 Collaborators
  - CDHD
  - USACE
  - LENRD, LLNRD, LRNRD, MNNRD, NNRD, SPNRD, URNRD
  - NPPD
- NDEQ Field Staff

NDEE Public Beach Monitoring Program



Monday/Tuesday

- Samples Collected and Shipped
  - *E. coli* analysis is conducted by collectors to meet holding times.

Tuesday/Wednesday

- Samples Sorted and Prepped

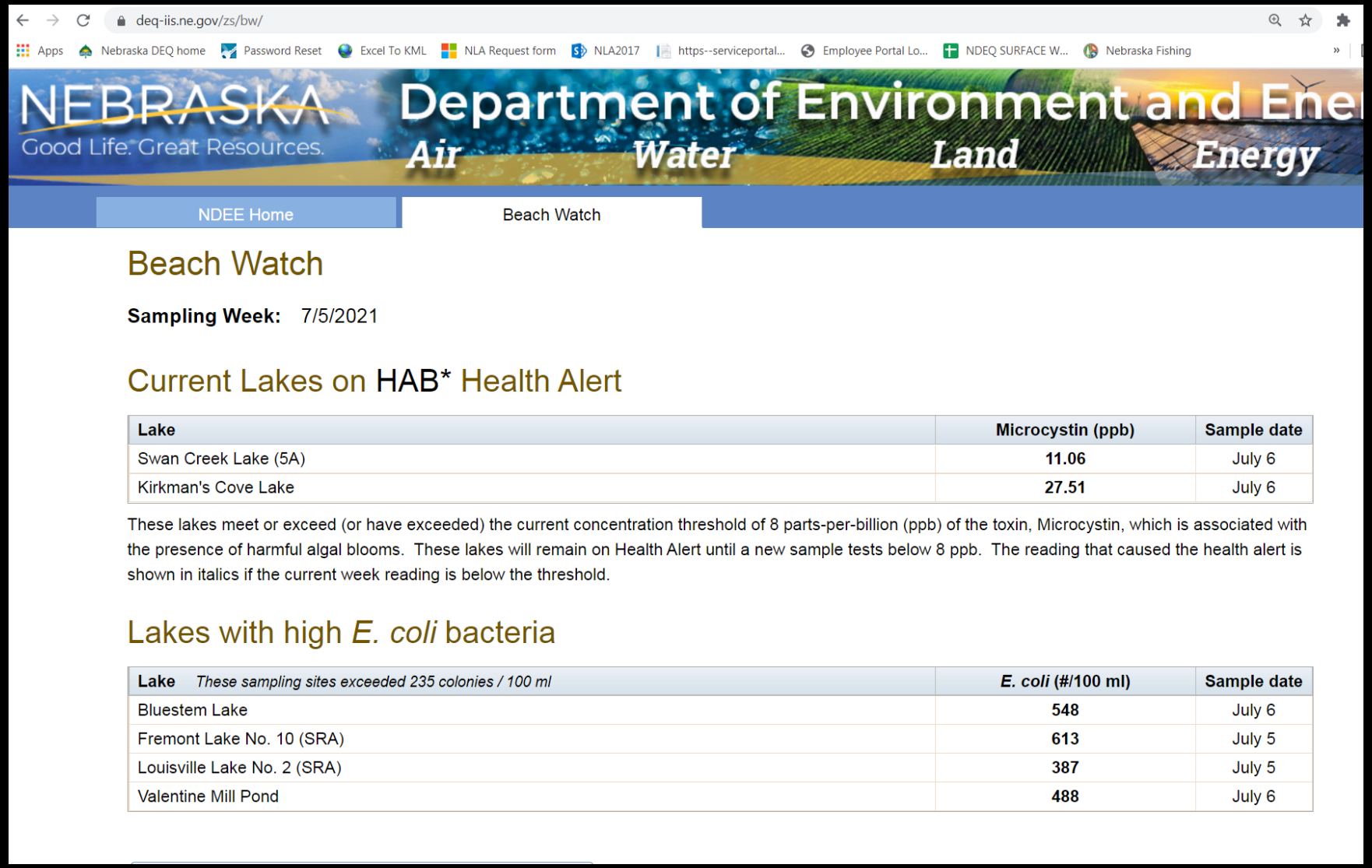
Wednesday/Thursday

- Microcystin Sample Analysis
- Lake Managers Contacted
- Results Posted to NDEQ Website
- Listserv Email Sent To Subscribers

Friday Morning

- Signs at Affected Beaches
- Joint Press Release to Media

NDEE Public Beach Monitoring Program



Beach Watch

Sampling Week: 7/5/2021

Current Lakes on HAB* Health Alert

Lake	Microcystin (ppb)	Sample date
Swan Creek Lake (5A)	**11.06**	July 6
Kirkman's Cove Lake	**27.51**	July 6

These lakes meet or exceed (or have exceeded) the current concentration threshold of 8 parts-per-billion (ppb) of the toxin, Microcystin, which is associated with the presence of harmful algal blooms. These lakes will remain on Health Alert until a new sample tests below 8 ppb. The reading that caused the health alert is shown in italics if the current week reading is below the threshold.

Lakes with high *E. coli* bacteria

Lake *These sampling sites exceeded 235 colonies / 100 ml*	*E. coli* (#/100 ml)	Sample date
Bluestem Lake	**548**	July 6
Fremont Lake No. 10 (SRA)	**613**	July 5
Louisville Lake No. 2 (SRA)	**387**	July 5
Valentine Mill Pond	**488**	July 6

NDEE Public Beach Monitoring Program

Fremont Lake No. 10 (SRA)	0		613
Fremont Lake No. 15 (SRA)	0		28
Fremont Lake No. 20 (SRA)	0		2

County and location Dodge County Google map

Week	Microcystin (ppb)	HAB* Alert?	*E. coli* (#/100 ml)
Jul 12, 2021			
Jul 5, 2021	0		2
Jun 28, 2021	3.31		67
Jun 21, 2021	0.43		9
Jun 14, 2021	0		1
Jun 7, 2021	0.89		1
May 31, 2021	0.26		40
May 24, 2021	0.27		37
May 17, 2021	0		0
May 10, 2021	0		2
May 3, 2021	0		16

Fremont Lake No. 9 (SRA)	0		4
Ft. Kearny Lake No. 1 (SRA)	0		15
Glenn Cunningham Lake (Site No. 11)	0		102
Harlan County Reservoir -- Southeast Beach	0		1
Harlan County Reservoir at Tipover Beach	0		6
Harry Strunk Lake (Medicine Creek Reservoir)	0		4
Holmes Lake	0		4
Hugh Butler Lake (Red Willow Reservoir)	0		2
Iron Horse Trail Lake (WMA)	2.47		12
Johnson Lake	0		3
Kirkman's Cove Lake	27.51	Yes	1
Lake C.W. McConaughy	0		1
Lake Maloney	0.38		5
Lake Minatare (North Platte NWR)	0		4
Lake North	0		0
West Mormon Island Lake (SRA)	0.32		4
Willow Creek Reservoir	6.85		0
Windmill Lake No. 5 (SRA)	0.17		1
Wirth Brothers Lake (Site 27)	0		291

Harmful algal blooms and *E. coli* sampling

NDEQ conducts weekly sampling for Harmful Algal Blooms (HABs), also known as toxic blue-green algae, and *E. coli* bacteria at 51 public recreational lakes (54 sites in all) across Nebraska from May through September and these results are updated weekly. Samples are typically collected on Monday and posted on the web site on Friday.

Current Lake(s) on Health Alert: Lakes that have been placed on **Health Alert** must subsequently have two consecutive weeks of readings below 20 ppb before the alert is ended.

20 ppb of microcystin is the limit that has been in effect in Nebraska since 2004, and will continue to be used through the 2018 recreational season. New research into the negative health effects of Harmful Algal Blooms (HABs) and their associated toxins has led the Environmental Protection Agency (EPA) to propose a new threshold concentration. This proposal is currently under review before being finalized. The Nebraska Department of Health and Human Services and the Nebraska Department of Environmental Quality have reviewed the proposal and the associated research and believes that the new recommendation has been made using the most current and best scientific evidence available. As such, if a recommendation becomes finalized by the EPA, the State of Nebraska intends to adopt the new lower criteria at the beginning of the next recreation season.

High bacteria: unusually high readings of ***E. coli* bacteria** can also be a health concern; samples above 235 colonies per 100 ml water are considered "high."

More information

No sample or blank values: if the value is marked "No sample" then the sample could not be collected or could not be analyzed. For example, sample container might have broken before it was analyzed. If the sample value is blank then the data has not been checked for validity.

Precautions and Facts Regarding Toxic Algae at Nebraska Lakes

Harmful Algal Bloom Facts * (links to an EPA website)

More information on *E. coli* bacteria and its potential health effects.

All Lakes lists the results for all lakes and provides buttons for viewing historical data.

Beach Watch ListServe Instructions

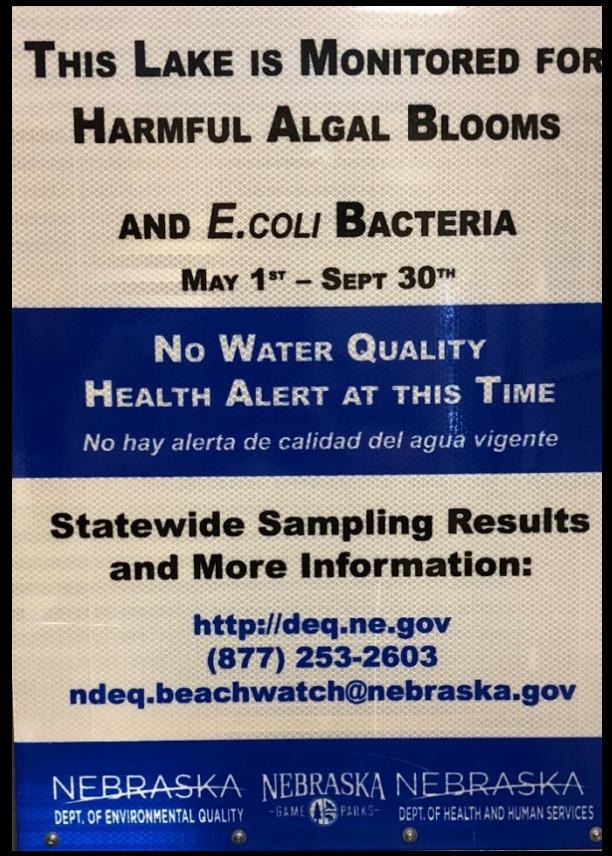
To subscribe to the listserv, send an email to listserv@listserv.nebraska.gov with "SUBSCRIBE DEQ-BeachWatch (your name)" in the body of the message (leave the Subject line blank).

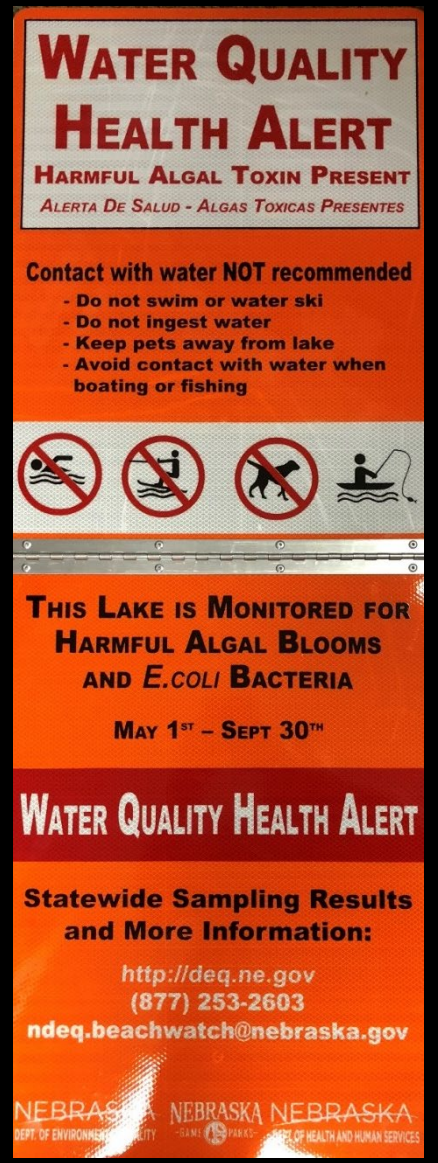
Example: `Subscribe DEQ-BeachWatch John Smith`

You will receive an email requesting you to confirm your request. When you confirm by clicking the link, you will be added to the listserv.

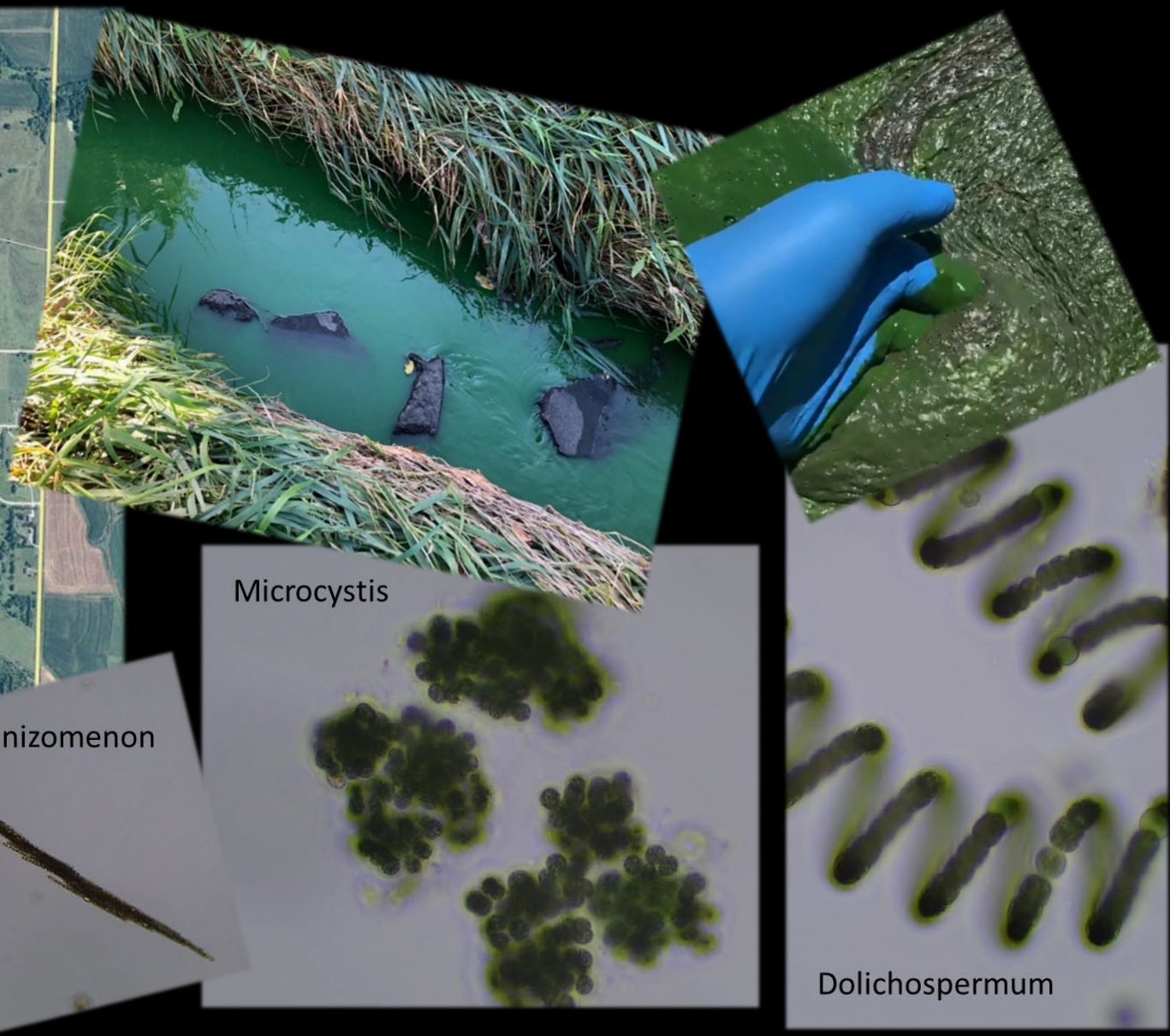
To unsubscribe, send an email to listserv@listserv.nebraska.gov In the body of the message, type SIGNOFF deq-BeachWatch.

NDEE Public Beach Monitoring Program

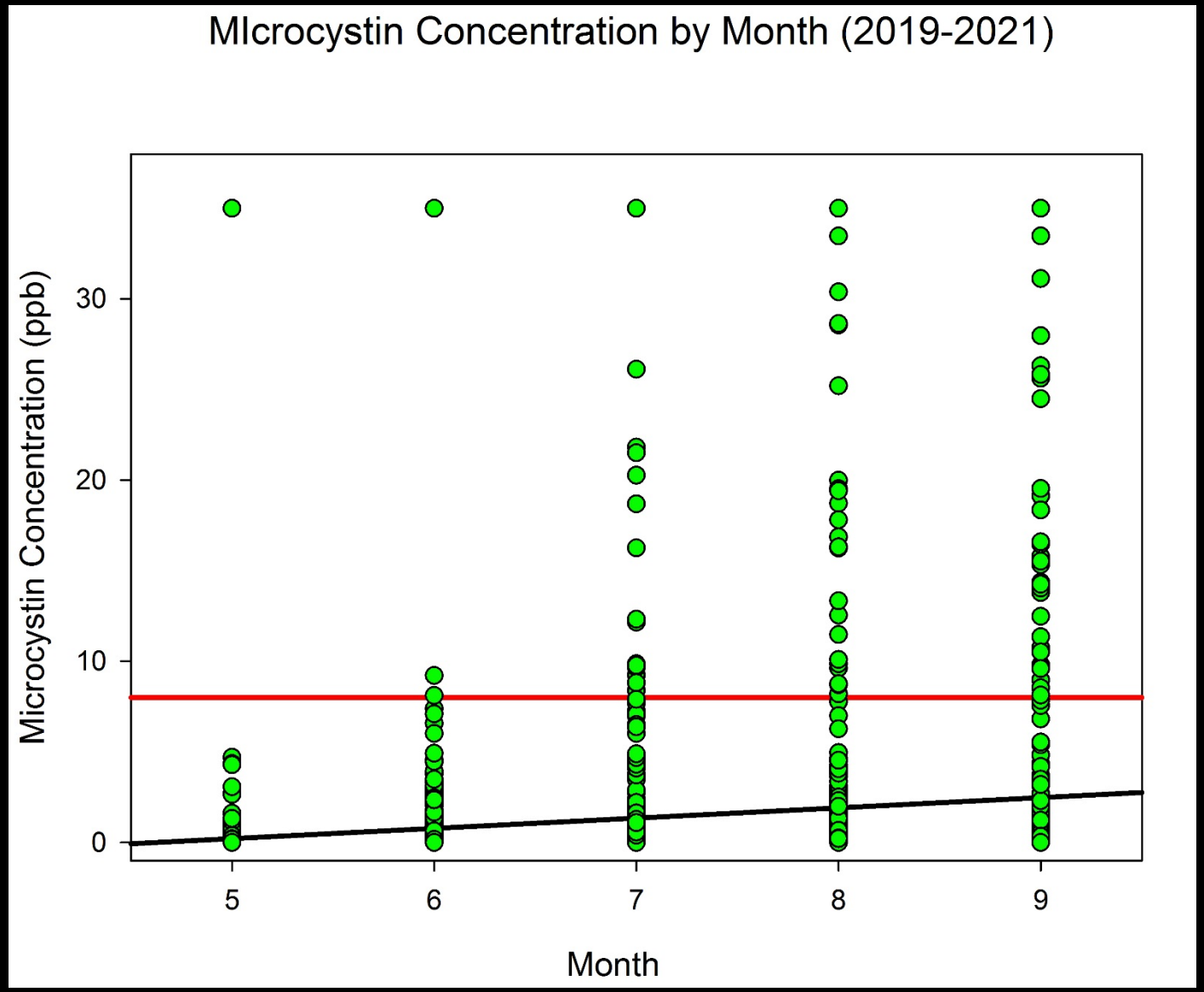




NDEE Public Beach Monitoring Program



NDEE Public Beach Monitoring Program



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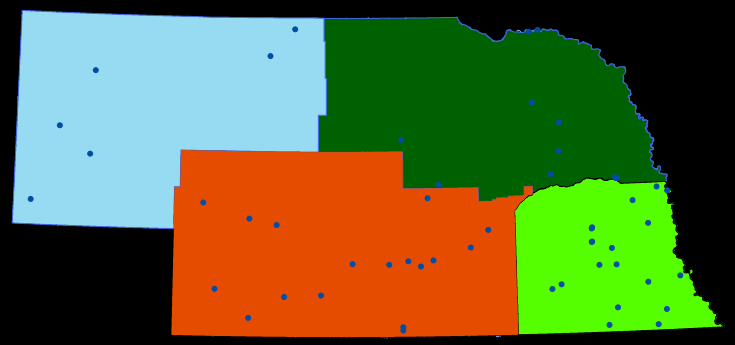
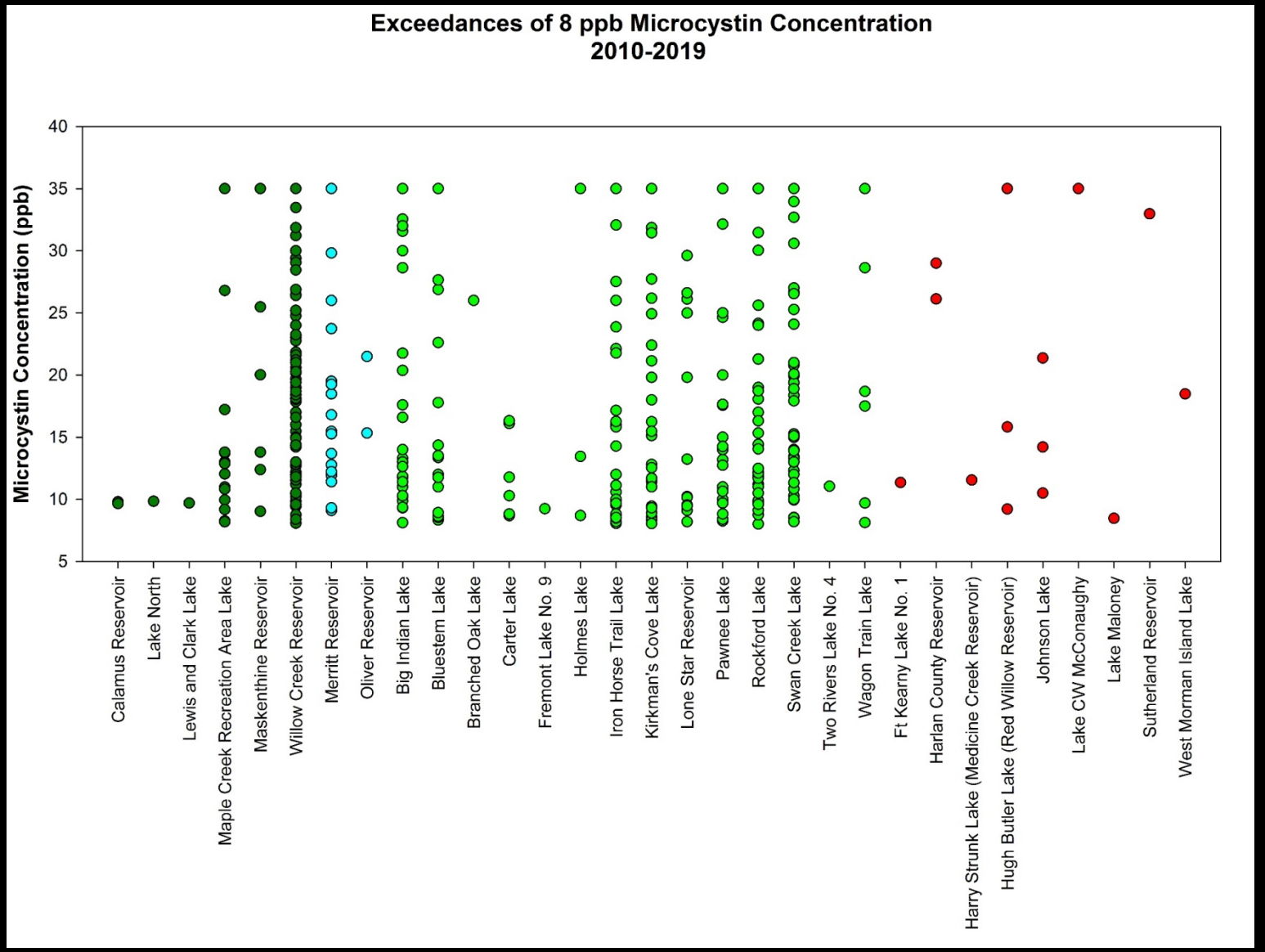
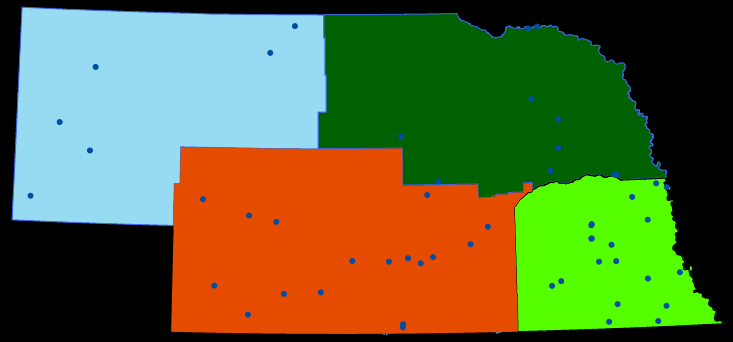
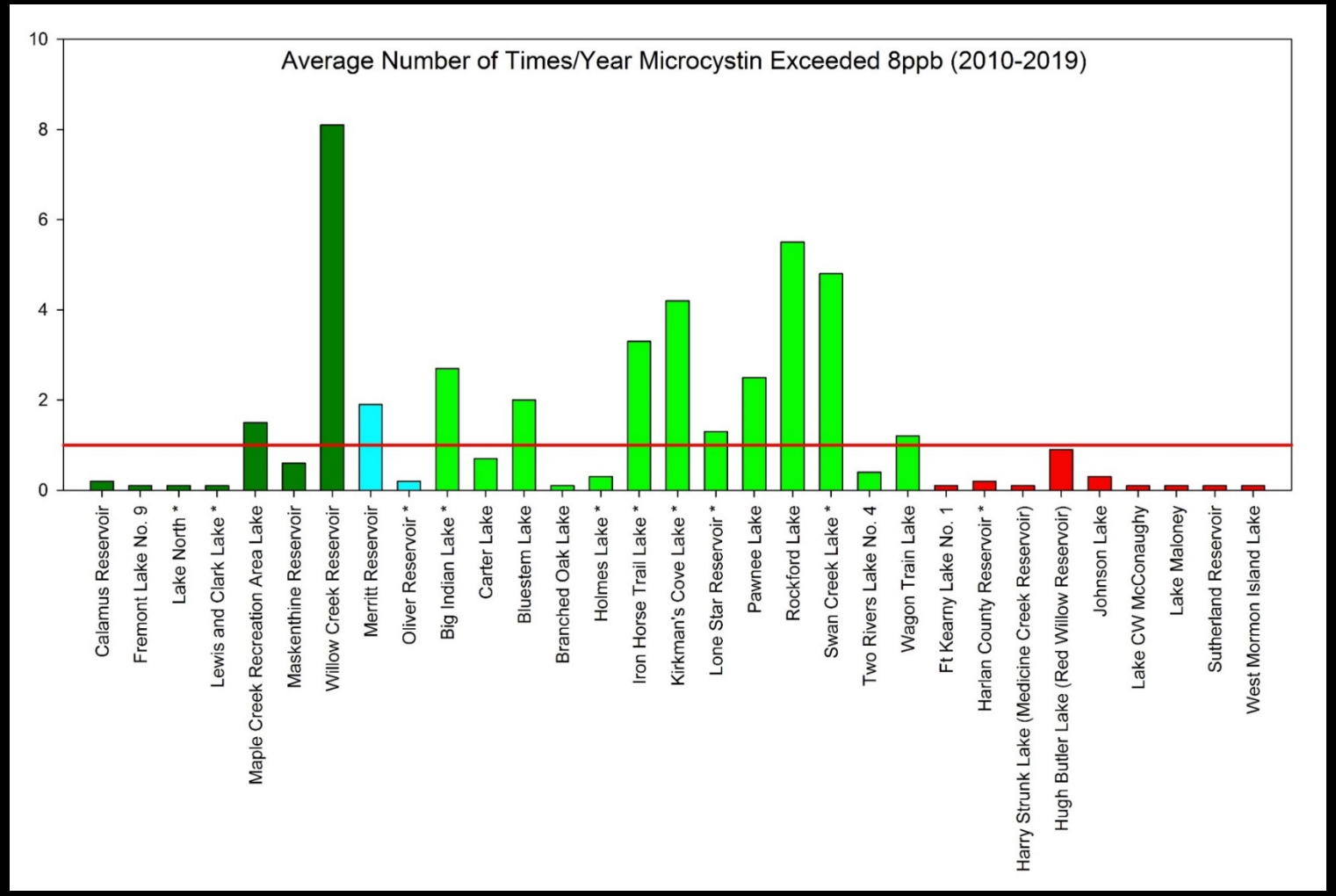




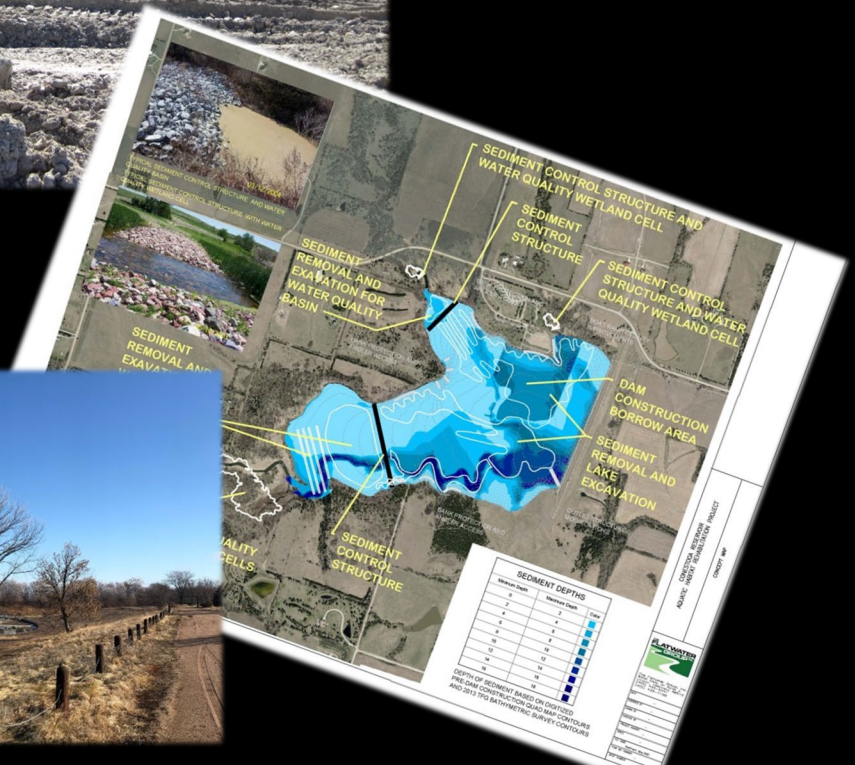
NDEE Public Beach Monitoring Program



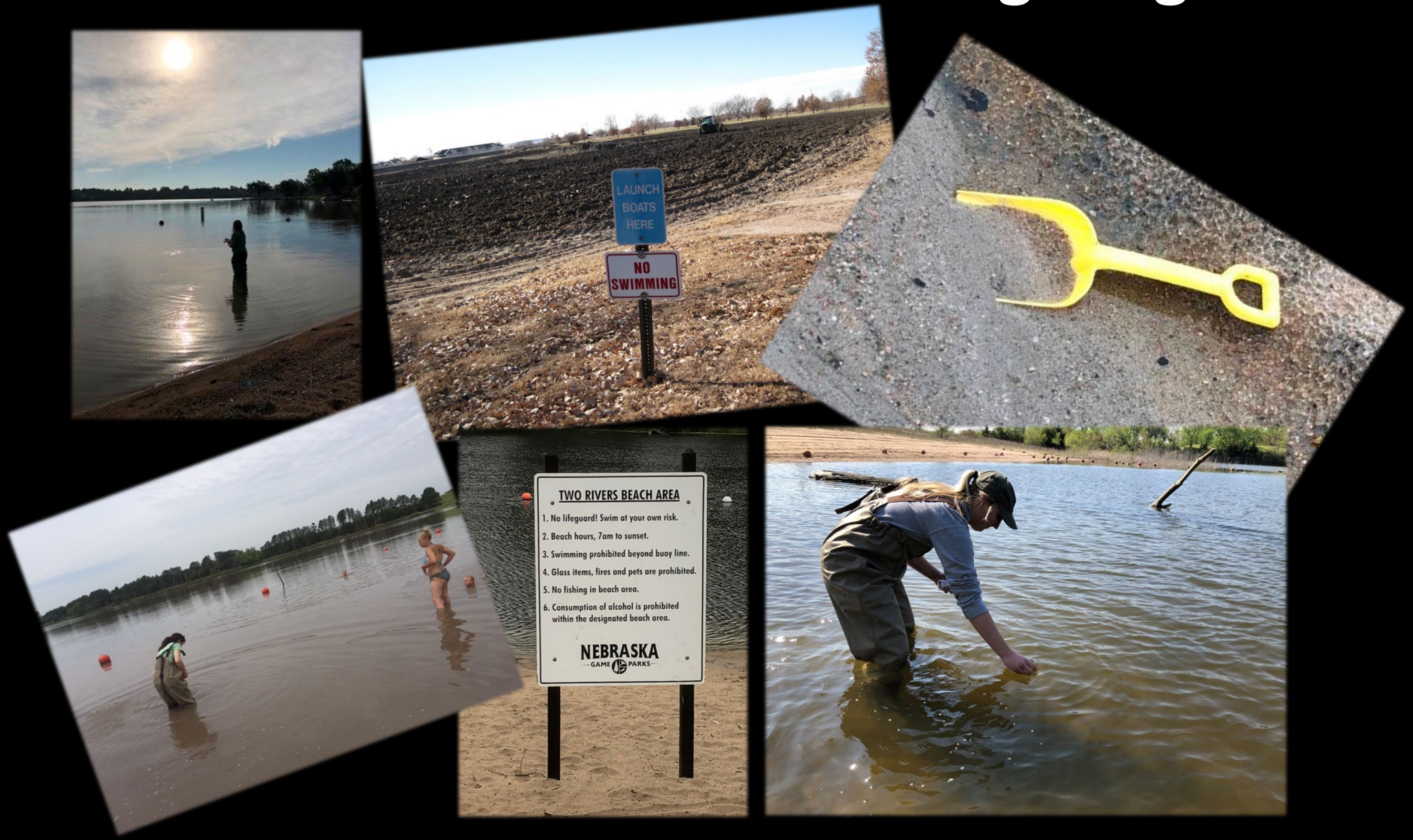


NDEE Public Beach Monitoring Program

- What are we doing about HAB control/prevention?
  - Watershed Management Plans
    - BMP Implementation
  - Research Partnerships
  - Lake Rehabilitation Partnerships
    - NGPC Aquatic Habitat
    - Nebraska Environmental Trust
    - Natural Resource Districts



NDEE Public Beach Monitoring Program



Sara Hudson

Sara Hudson, Director, City of Ashland Parks and Recreation Department. Sara has worked for the since of Ashland since 2006 and has been involved in beach management since. She is co-chair of the Wisconsin Coastal Beaches Working Group and member of the International Joint Commission Water Quality Board.

Coast to Coast Collaboration:

FROM LAKE SUPERIOR TO LAKE MICHIGAN AND ALL THE LAKES IN BETWEEN, HOW THE WISCONSIN COASTAL BEACHES WORK GROUP COOPERATES TOGETHER ON BEACH MONITORING POLICIES, PROCEDURES AND OUTREACH/EDUCATION

Sara Hudson, City of Ashland Parks and Recreation Director
and Wisconsin Coastal Beaches Work Group Co-Chair

Wisconsin Coastal Beaches Work Group

Is made up of professionals, researchers and funders involved in managing and improving Wisconsin's 200+ Great Lakes beaches.

Photos courtesy of WDNR Great Water Calendar Contest

Photo courtesy of WDNR Great Water Calendar Contest

Core Functions:

Information Sharing

Coordination/ Leveraging

Stakeholder Input

Research Guidance

Funding Information

Collaborative Work

Invasive Species

Erosion and Sediment Transport

Coastal Storms

Water Level Changes

Economics/Tourism

Water Quality

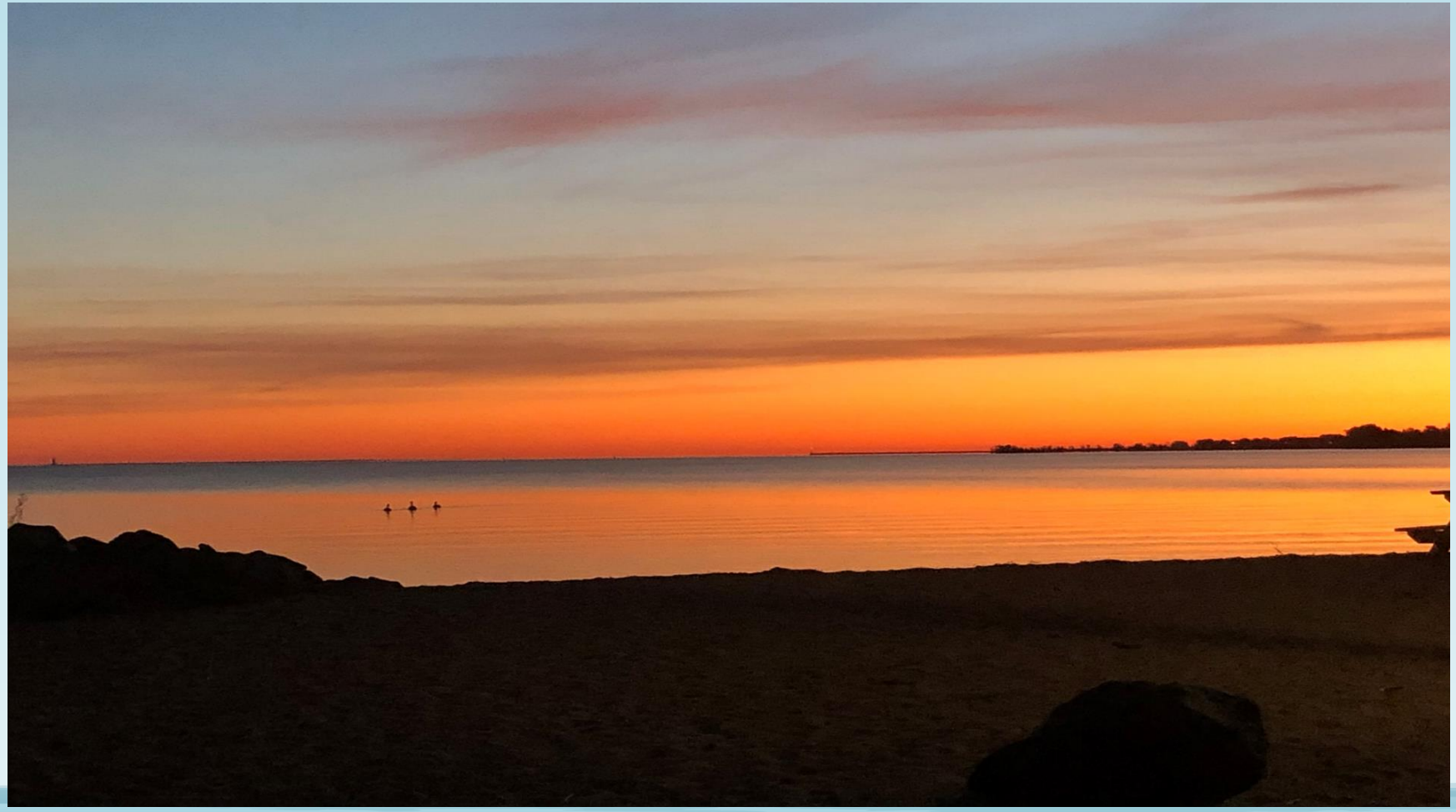
Dangerous Currents

Harmful Algal Blooms

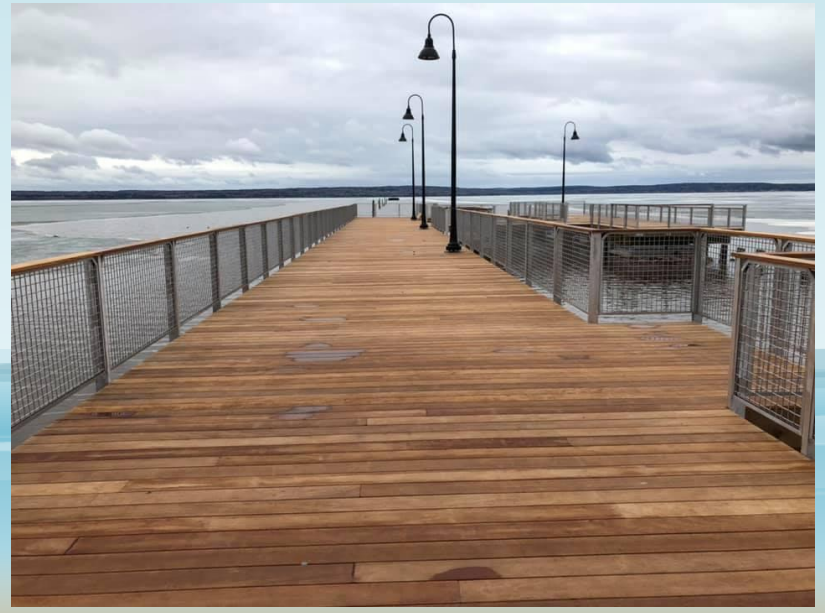
Habitat Improvement

Green Infrastructure

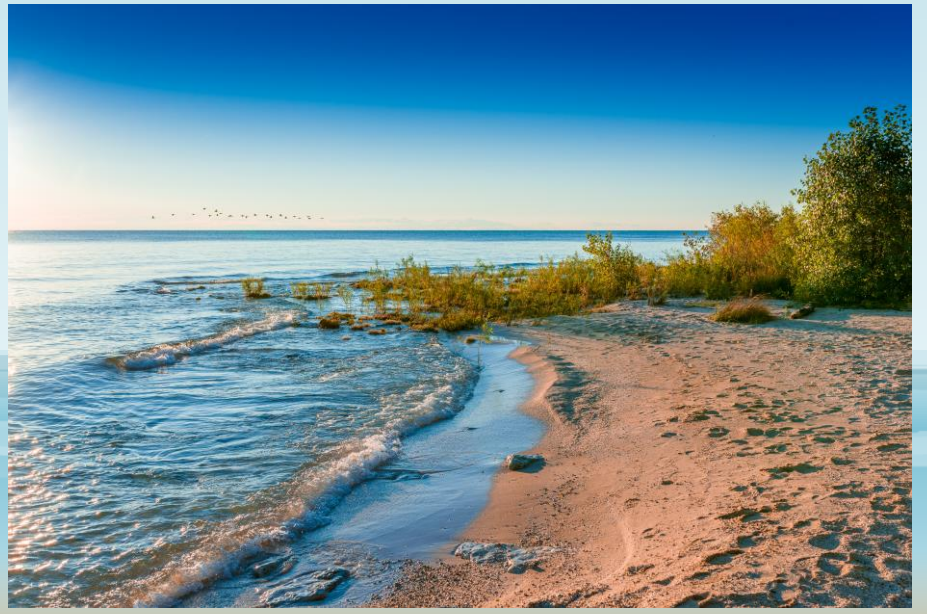
Why are Beaches Important



Wisconsin Beach Policies: EPA's BEACH Act and Wisconsin DNR



MORE INFO @
WISCONSIN DNR
BEACHES WEBSITE



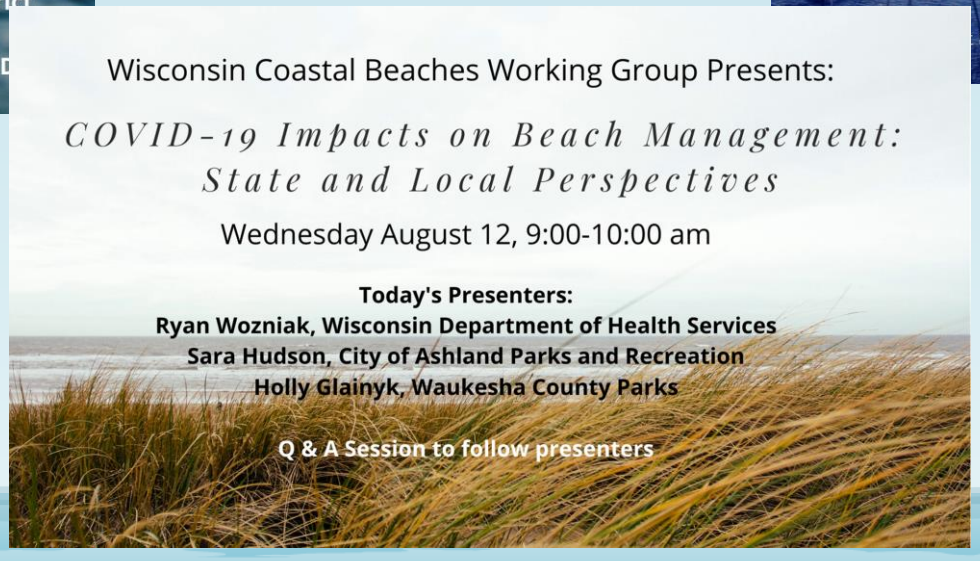
WDNR Beach Sanitary Survey:

Procedures

Northland College Mary Griggs Burke Center For Fresh Water Innovation Student Researcher performing Beach Sanitary Survey at Maslowski Beach, Ashland WI

Wisconsin DNR Beach Signs

Outreach and Education



https://infos.cee.wisc.edu/wisc-watch/index.php

Thank You

https://dnr.wisconsin.gov/topic/Beaches

https://www.seagrant.wisc.edu/our-work/focus-areas/coastal-communities/wisconsin-coastal-beaches-workgroup/

Sara Hudson, Director
Parks and Recreation Department
City of Ashland, WI

shudson@coawi.org

Photo courtesy of WDNR Great Water Calendar Contest

Nate Bosch

Nate Bosch received his Ph.D. in 2007 from the University of Michigan in the field of limnology. He has numerous peer-reviewed publications spanning research in the Great Lakes to smaller inland lakes and streams. Dr. Bosch is currently a Professor in the Environmental Science program at Grace College and directs the Lilly Center for Lakes & Streams at Grace College as well.

LILLY CENTER FOR LAKES & STREAMS

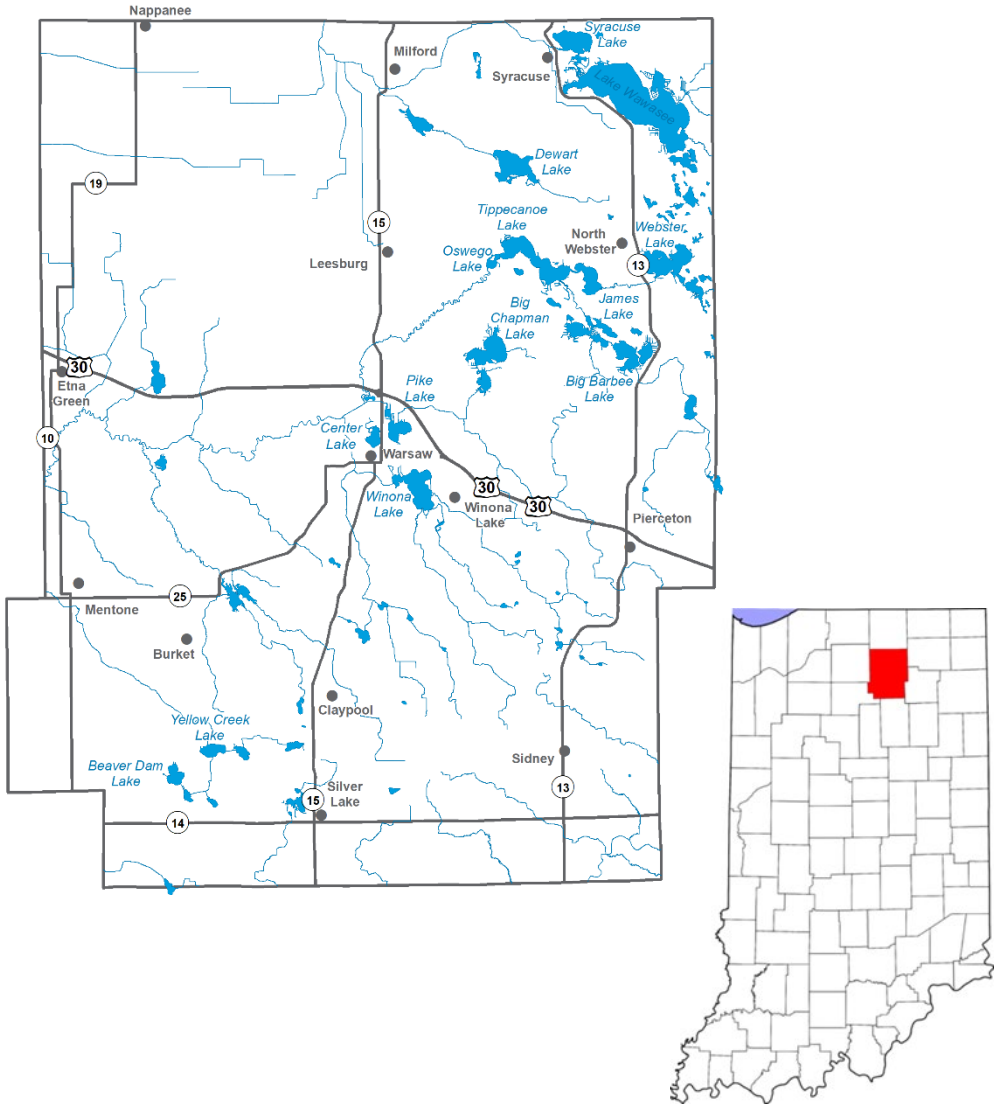
Algae toxins and *E. coli* at beaches in inland lakes of Indiana

Dr. Nate Bosch, Director
July 14, 2021
The Current - North Central Region Water Network

LILLY CENTER FOR LAKES & STREAMS

Context

- Kosciusko County, Indiana
- Lakes
  - Over 100 lakes
  - Lake Wawasee
  - Lake Tippecanoe
- Streams
  - Almost 600 miles of streams
  - Tippecanoe River
- Continental divide



LILLY CENTER FOR LAKES & STREAMS

Our Mission

Making our lakes and streams clean, healthy, safe and beautiful.

Our Strategy

- Research
  - Solving problems strategically
  - Identifying emerging threats
- Education
  - Inspiring the next generation
  - Changing behavior now
- Collaboration
  - Effectiveness
  - Efficiency

LILLY CENTER FOR
LAKES & STREAMS

Research

- Lake and stream sampling
- Economic impact of lakes
- Trends analysis
- Lake water levels
- Public sewers around lakes
- Nutrient budgets
- Boating and zebra mussels
- Weed control and shoreline vegetation
- *E. coli* and algae toxins…

Context

Mission

Research

E. coli

Microcystin

LILLY CENTER FOR LAKES & STREAMS

E. Coli - Public Beaches

Context

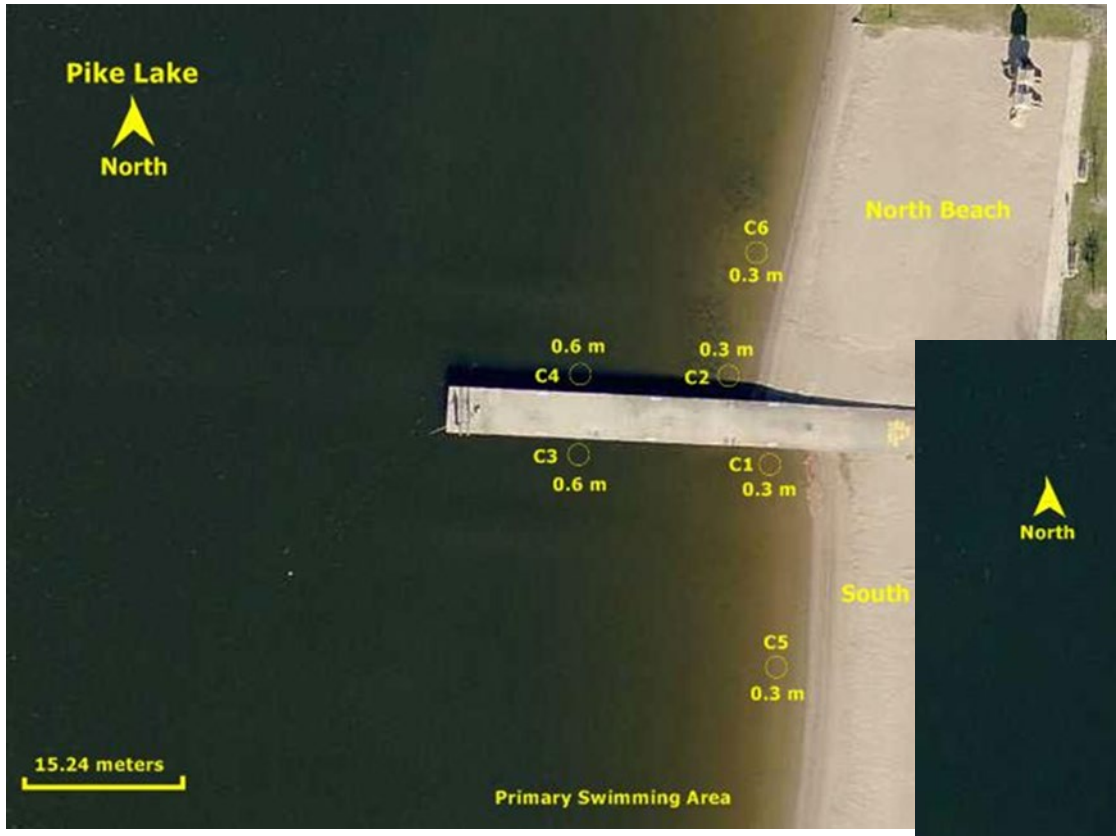
Mission

Research

E. coli

Microcystin

E. Coli - Public Beaches



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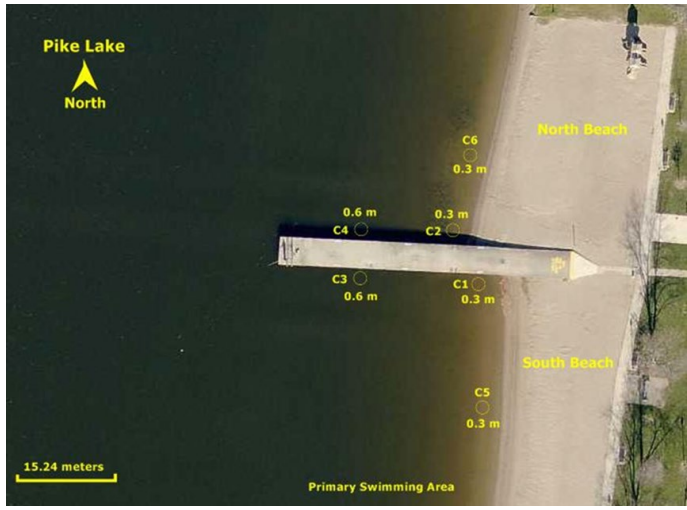
LAKES & STREAMS

Location Results

- Left side of both piers had higher *E. coli* levels
- Near shore had higher *E. coli* levels
- Higher *E. coli* levels in vertex sites
- Southerly and westerly winds likely led to higher *E. coli* levels
- Center Lake had consistently higher *E. coli* levels compared to Pike Lake
  - Over beach closure limit 51% of the time



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Other Results

- No connection between pH or water temperature and *E. coli* observed
- Slight increase in *E. coli* with increased swimmer activity (r^2=0.35)
- Microbial Source Tracking
  - Center Lake
  - Vertex and drain
  - Gulls
- Recommendations and solution

BG Algae - Research History

- **Pilot study (2009)**
  - Problem identified
- **Partnership launched (2010)**
  - Characterizing problem
- **Growing understanding (2012)**
  - Timing and consistency
- **Developing predictions (2015)**
  - Other toxins, forecast and control
- **Testing screening and prediction (2017)**
  - Low-cost, rapid screening and prediction?

Context

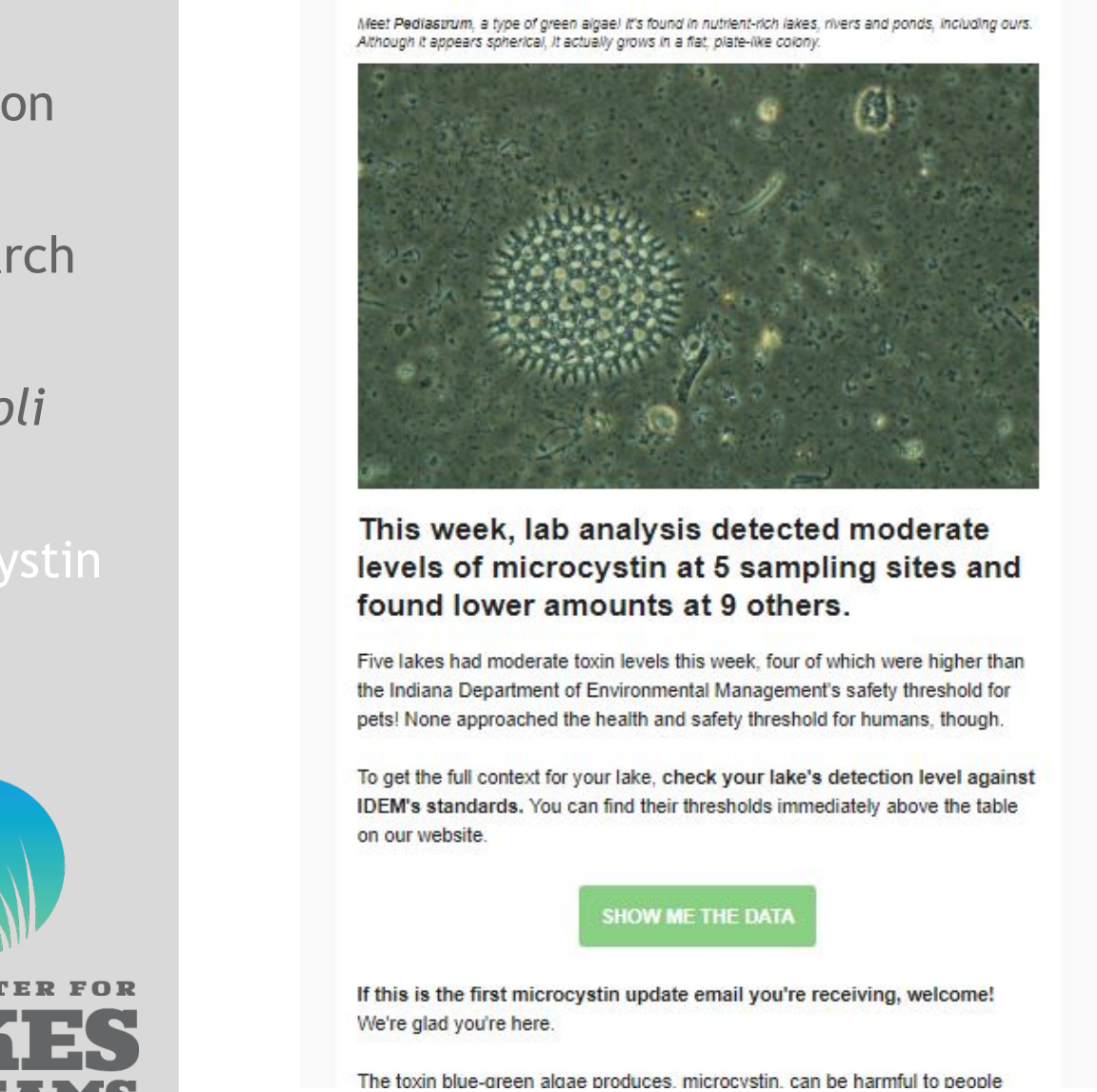
Mission

Research

E. coli

Microcystin

MC Notification



Meet Pediastrum, a type of green algae! It's found in nutrient-rich lakes, rivers and ponds, including ours. Although it appears spherical, it actually grows in a flat, plate-like colony.

This week, lab analysis detected moderate levels of microcystin at 5 sampling sites and found lower amounts at 9 others.

Five lakes had moderate toxin levels this week, four of which were higher than the Indiana Department of Environmental Management's safety threshold for pets! None approached the health and safety threshold for humans, though.

To get the full context for your lake, **check your lake's detection level against IDEM's standards.** You can find their thresholds immediately above the table on our website.

SHOW ME THE DATA

If this is the first microcystin update email you're receiving, welcome! We're glad you're here.

The toxin blue-green algae produces, microcystin, can be harmful to people

- **Sampling**
  - 7 public beaches, 14 open water sites
  - ELISA for MC-ADDA
- **Notification**
  - Goal: make data available with interpretation and guidance
  - Weekly email when data is available

LILLY CENTER FOR LAKES & STREAMS

Context

Mission

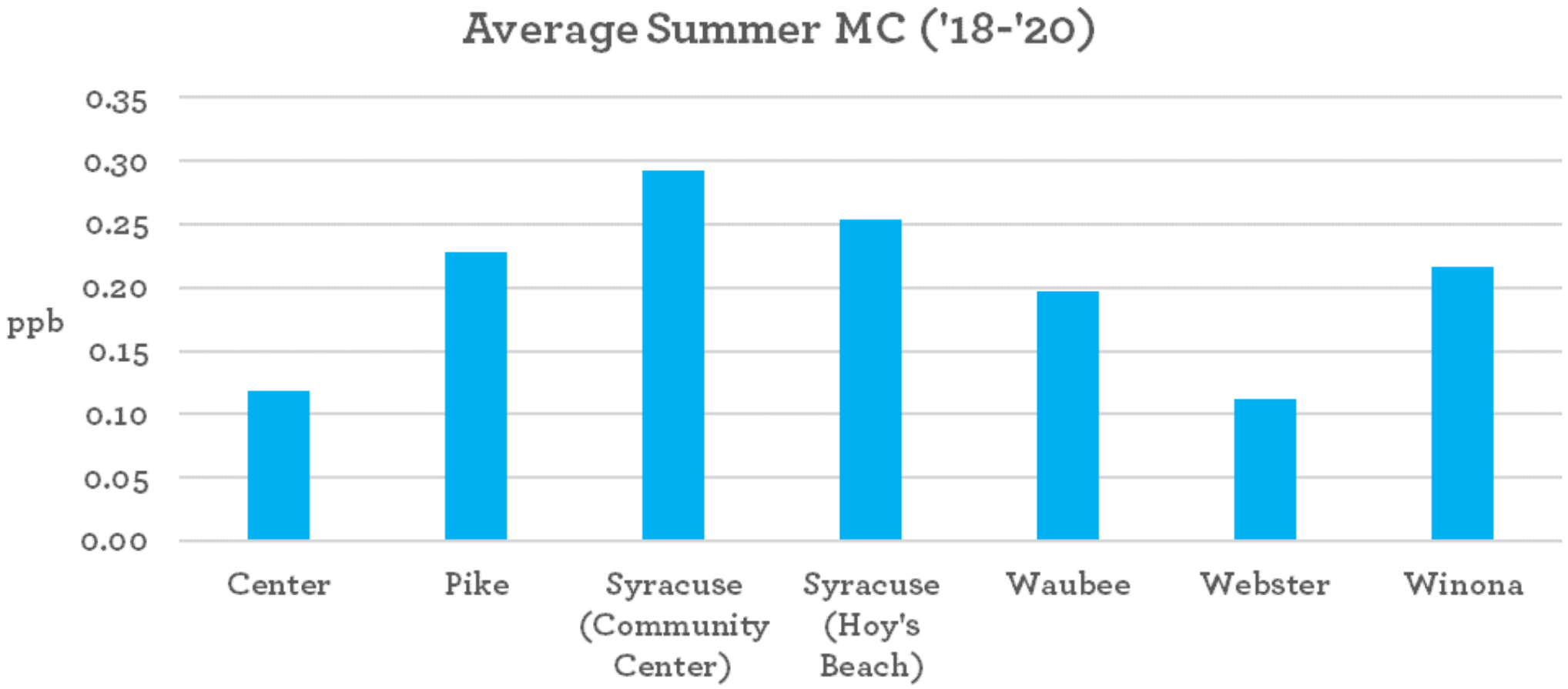
Research

E. coli

Microcystin

LILLY CENTER FOR LAKES & STREAMS

Microcystin at Kosciusko County Beaches



Context

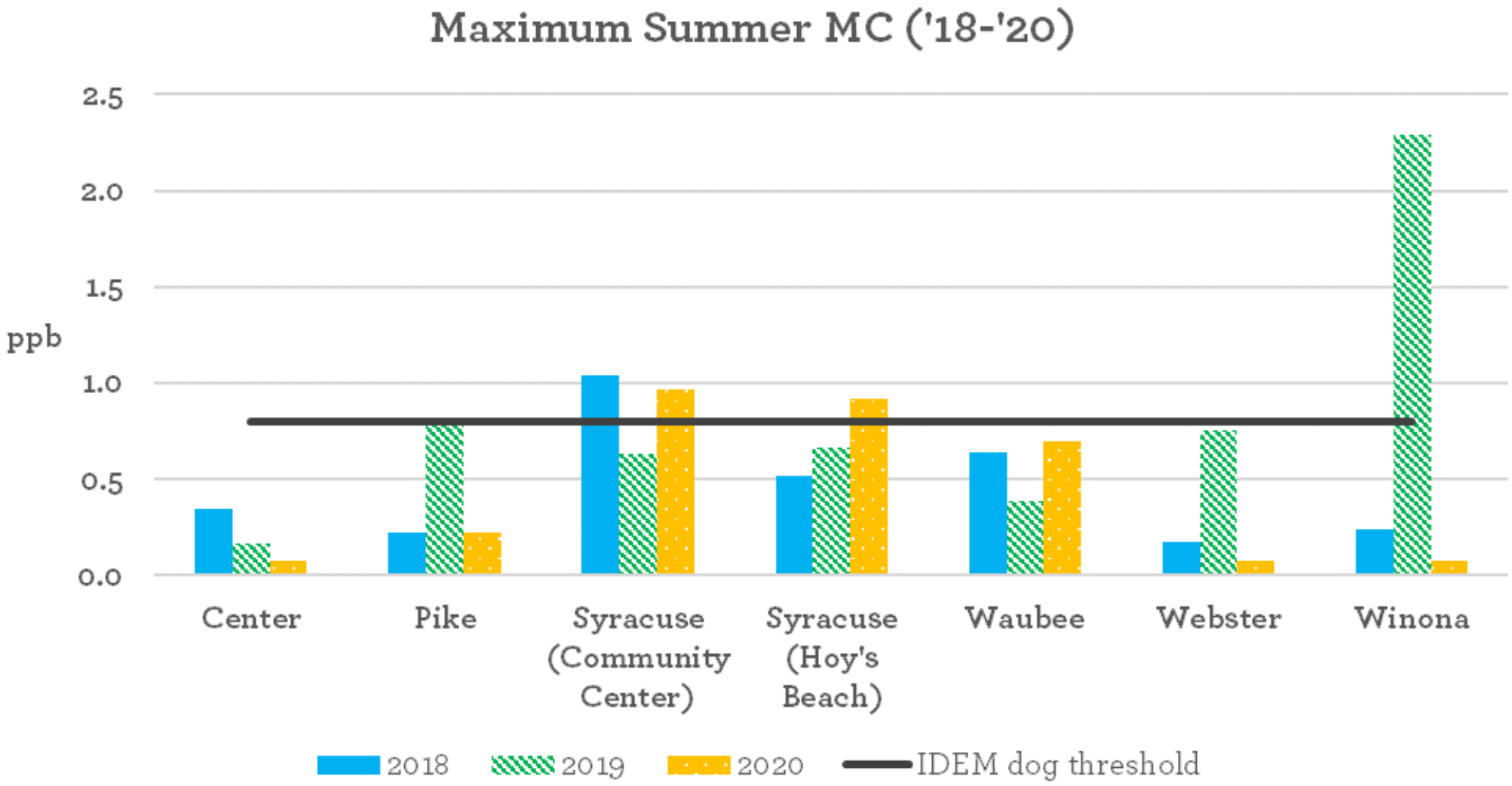
Mission

Research

E. coli

Microcystin

Microcystin at Kosciusko County Beaches



LILLY CENTER FOR LAKES & STREAMS

Context

Mission

Research

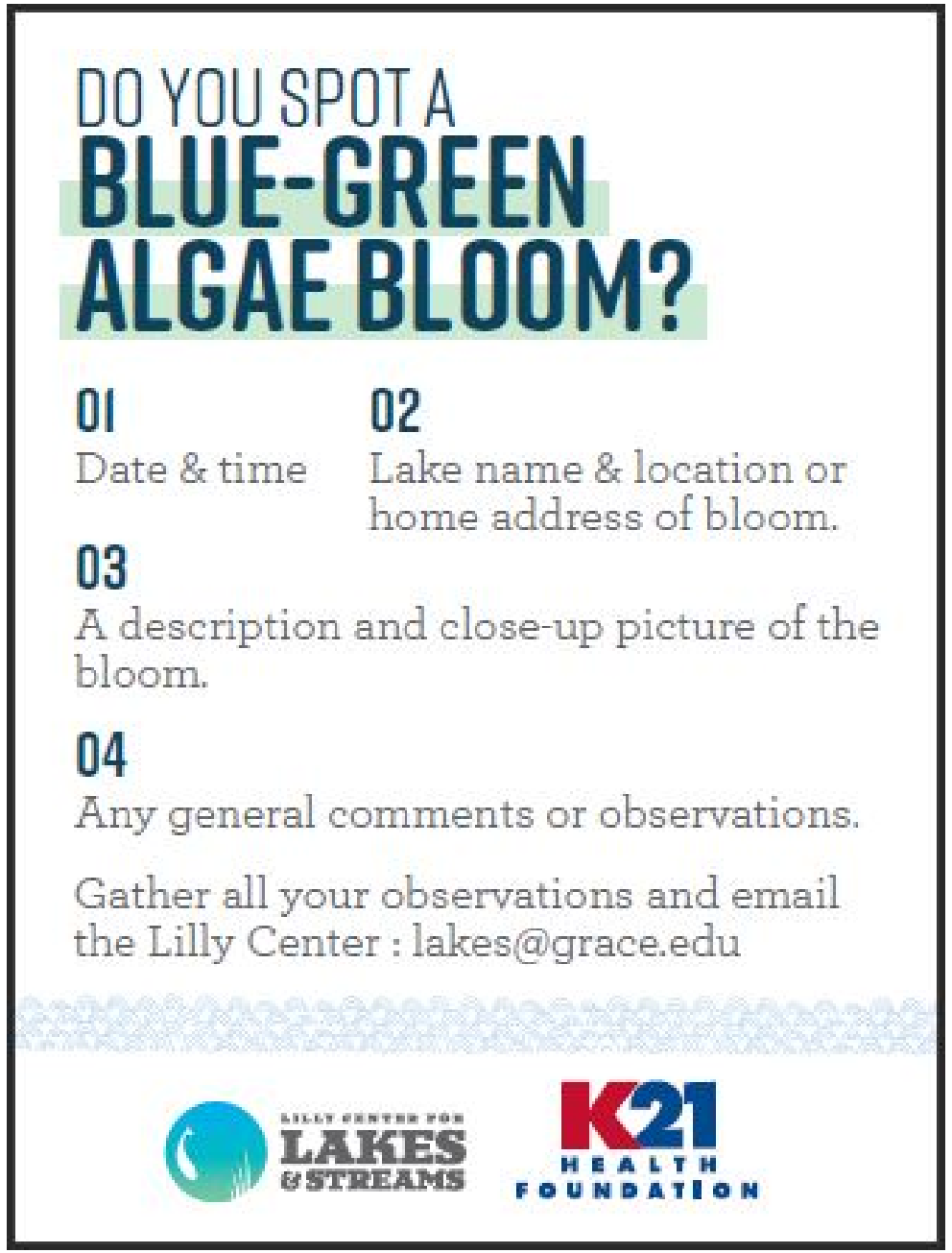
E. coli

Microcystin

LILLY CENTER FOR LAKES & STREAMS

Citizen Reporting and Next Steps

- *E. coli* sampling for beaches and streams
- Analysis of algae populations and toxin levels
- Ongoing education



Thank you!

LILLY CENTER FOR LAKES & STREAMS | GRACE COLLEGE

NORTH CENTRAL REGION WATER NETWORK

Samantha Fontenelle

Commander Samantha Fontenelle is a Commissioned Officer with the U.S. Public Health Service stationed at the U.S. Environmental Protection Agency, Office of Water, Office of Science and Technology. She supports the EPA's Fish and Beach programs and is the Technical Lead for EPA's Sanitary Survey App for Marine and Freshwaters. Prior to joining the Office of Science and Technology, Commander Fontenelle worked in Office of Groundwater and Drinking Water supporting the development of the Water Laboratory Alliance. Commander Fontenelle has a Master of Public Health from Johns Hopkins University.

EPA's New Sanitary Survey App for Marine and Fresh Waters

INTRODUCTION:

Sanitary surveys are used to identify sources of fecal contamination affecting the water quality of any fresh or marine recreational water and have been used successfully in EPA's Beach Program for many years. The App can be used to gather data for any waterbody (lakes, rivers, streams, marine beaches) and includes questions to identify harmful algal bloom (HAB) events.

Data collected using the App include:

- Meteorological – rainfall, air temp, wind speed
- Physical – beach length, width, slope
- Water Quality – water temp, samples, odor, turbidity
- Land use - % development, beach structures
- Pollution sources – wastewater, septic, marinas, wildlife

APP FEATURES

- Mobile app that and can be used on any device (computer, phone, tablet).
- No WiFi or Internet access needed to complete surveys in the field.
- Includes new questions to identify HAB events.
- Geolocates sites where data are collected.
- Includes capability to include photos.
- Links to websites such as BEACON for beach IDs, National Weather Service for weather-related information (e.g., rainfall, air temperature).
- Stores survey data on EPA's GeoPlatform at no cost.
- Easy data download for sharing and use in predictive models.
- Data is not publicly available.

USING THE APP

Step 1: Request access credentials from EPA at https://request.ercloud.org/requestaccount

Step 2: Download the **ArcGIS Survey123 app by ESRI** from the app store. The Sanitary Survey App is accessible only through the ArcGIS Survey123 app.

Step 3: Download the Sanitary Surveys in ArcGIS Survey 123 app and begin collecting data.

- **Instructions for using the app can be found at https://www.epa.gov/beach-tech/instructions-epa-sanitary-survey-app-marine-and-fresh-waters.**

Available for use by states, territories, tribes, local governments, citizen science and environmental groups, and the public.

EPA App Contact:

CDR Samantha Fontenelle
fontenelle.Samantha@epa.gov
EPA_SanitarySurveyApp@epa.gov

Question and Answer Session

We will draw initial questions and comments from those submitted via the chat box during the presentations.

Today's Speakers

Mike Archer – mike.archer@nebraska.gov
Sara Hudson – shudson@coawi.org
Nate Bosch – boschns@grace.edu
Sharon Frey – Frey.Sharon@epa.gov

Thank you for participating in today's *The Current*!

Visit our website, northcentralwater.org, to access the recording and our webinar archive!

Upcoming webinar from our soil health team, The Soil Health Nexus:

Soil Corridors for Soil Health with Joel Gruver
Next Wednesday, July 21st at 2pm CT
https://soilhealthnexus.org/