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NOAA Great Lakes Harmful Algal Bloom Communication Preparedness Workshop Report

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Proceedings of the Great Lakes Harmful Algal Bloom (HAB) Communication Preparedness Workshop

Virtual Workshop
January 17-18, 2023

Photo Credit: NOAA

https://crrc.unh.edu/resource/GL_HABS

I. Table of Contents

II. Acronyms

CRRC	Coastal Response Research Center
DPP	NOAA Disaster Preparedness Program
EGLE	Environment, Great Lakes & Energy (MI Dept of Environment)
EH	Environmental Health
GLOS	Great Lakes Observing System
HAB	Harmful Algal Bloom
HABHRCA	Harmful Algal Bloom and Hypoxia Research and Control Act
HHS	U.S. Department of Health and Human Services
ITRC	Interstate Technology and Regulatory Council
IWG-HABHRCA	Interagency Working Group on the Harmful Algal Bloom and Hypoxia Research and Control Act
NCCOS	NOAA National Centers for Coastal Ocean Science
NOAA	U.S. National Oceanic and Atmospheric Administration
NOS	NOAA National Ocean Service
NPS	U.S. National Park Service
ORD	Office of Research and Development
OR&R	NOAA Office of Response and Restoration
PHMC	Public Health Muskegon County (MI)
UNH	University of New Hampshire
U.S.	United States
USEPA	U.S. Environmental Protection Agency

III. Acknowledgements

This workshop, tabletop exercise, and report were supported by the National Oceanic and Atmospheric Administration's (NOAA) Great Lakes Regional Collaboration Team, Office of Response and Restoration (OR&R) Disaster Preparedness Program (DPP) and the Coastal Response Research Center (CRRC). The content for the workshop was developed in cooperation with NOAA DPP and the following Organizing Committee members:

- Nancy Kinner, CRRC, University of New Hampshire (UNH)
- Charlie Henry, NOAA OR&R DPP
- Ruth Briland, Ohio Environmental Protection Agency (EPA)
- Jennifer Day, NOAA, Great Lakes Regional Collaboration Team
- Regan Errera, NOAA, Great Lakes Environmental Research Laboratory
- Felix Martinez, NOAA, NCCOS
- LCDR Rachel Pryor, NOAA, Great Lakes Scientific Support Coordinator (reassigned after workshop)
- Chris Winslow, Ohio Sea Grant
- Tony Marshak, NOAA, Fisheries
- Lauren Courtemanche, CRRC, UNH

This workshop was facilitated by Nancy Kinner (www.crrc.unh.edu). CRRC is known globally as an independent intermediary that brings all stakeholders to the table to develop and implement viable and trusted solutions to complex problems related to environmental disasters. CRRC has conducted 90+ workshops that bring together practitioners, researchers, and scientists of diverse backgrounds (e.g., industry, academia, government, NGOs) to discuss and develop solutions to marine pollution and disaster problems.

We would like to thank each of the speakers and presenters for their participation in the workshop:

- LCDR Rachel Pryor, NOAA, Great Lakes Scientific Support Coordinator
- David Kidwell, NOAA NCCOS and IWG-HABHRCA Co-Chair
- Jennifer Day, NOAA Great Lakes Regional Coordinator
- Felix Martinez, NOS/NCCOS/Competitive Research Program
- Gina LaLiberte, Wisconsin Dept. of Natural Resources
- Shannon Nabors, Ohio EPA
- Katie Krushinski, NOAA OR&R DPP
- Marybeth Baur-Martinez, Washtenaw County (MI), National Alliance on Mental Illness
- David Fitch, Great Lakes Observing System, Communications
- Aabir Banerji, U.S. EPA
- Michael Eslick, Muskegon County (MI) Public Health

We would like to thank Kathy Mandsager (CRRC) for managing the technical aspects of the virtual workshop. We also thank the Group Leads/Facilitators: Jennifer Day, Felix Martinez, Rachel Pryor, and Chris Winslow; and Lauren Courtemanche (CRRC), Alice House (CRRC),

Wesley Lambert (CRRC), Tori Sweet (CRRC), and James Wood (CRRC) for their notetaking throughout the workshop.

IV. Executive Summary

On January 17-18, 2023, the CRRC and NOAA's DPP co-sponsored a virtual workshop titled "Great Lakes Harmful Algal Bloom (HAB) Communication Preparedness Workshop." This workshop was a focused discussion on HAB preparedness and response capabilities across the federal government and state agencies. See Appendix A for the workshop agenda. Workshop participants represented academia, federal, state, and local agencies. Presentation summaries can be found in the section of this report titled *Plenary Presentations*. Presentation slides can be found in Appendix B.

The specific objectives for this workshop were:

A. Ensure effective coordination and communication across local, state, and federal governments, and other relevant entities
    a. Compile and review existing plans, policies and procedures about effectively communicating HAB threats, including benthic and nuisance blooms, across relevant agencies.
    b. Determine the points of contact (POC's) responsible for HAB event preparedness and response.
    c. Create a process(es) for sharing information among relevant entities that ultimately reaches stakeholders and the public in a unified message.
B. Understand lessons learned from case studies (e.g., Lake Erie) and their relevance to emerging HAB outbreak locations (e.g., Lake Superior); and apply them to current and emerging threats.

The two-day workshop included presentations from federal, state, and non-governmental organization representatives discussing the following: participant demographics; lessons learned for past HABs events; risk and crisis communication strategies; social science communication research; surveys on preferred communication methods; and existing HABs plans, policies, and procedures.

The UNH Survey Center conducted a survey of stakeholders prior to the workshop. The 21-question survey was sent to 157 people on September 6, 2022, and closed on September 26, 2022. Thirty-two respondents completed the survey, resulting in a response rate of 20%. It inquired about general demographics (i.e., organization name, region), what bodies of water fall under their jurisdiction, what their role is during communication of a HABs event and methods, as well as open ended questions on individual's most recent HABs experience and potential improvements. More information about the survey and results can be found in Appendix D.

V. Workshop

A. Introduction

Prior to the workshop, participants were encouraged to watch two informational videos detailing past HABs events in the Great Lakes region. The videos were:

1. Case Study: Lake Superior HAB Event 2021, by Gina LaLiberte, Wisconsin DNR

2. Case Study: Toledo, Ohio HAB Event 2014, by Shannon Nabors, Ohio EPA

B. Presentations Day 1

"Introduction"

LCDR Rachel Pryor, *Great Lakes Scientific Support Coordinator,* **NOAA | OR&R**

In 2019, USEPA conducted a workshop and tabletop exercise on CyanoHABS in Seattle, WA. In 2021, CRRC conducted a virtual workshop on this topic for NOAA DPP. The Great Lakes region has encountered HABs incidents and shared the need to conduct this workshop with a second day focus on communication and improved collaboration.

"HABHRCA Overview"

David Kidwell, *Director Competitive Research Program,* **NOAA | National Centers for Coastal Ocean Science**

To address the increasing severity of HABs issues and the complexity of coordinating throughout the federal government, Congress established an interagency task force, also known as the Interagency Working Group - Harmful Algal Bloom and Hypoxia Research and Control Act (IWG-HABHRCA). The IWG-HABHRCA leverages the expertise and capabilities of the federal government to develop strategies to prevent possible outbreaks, and advance research and actions that enable possible control and mitigation approaches for HABs and hypoxia. Not only does the IWG-HABHRCA convene federal agencies to coordinate and develop strategies to address HABs and hypoxia, it also is a trusted source of information for stakeholders. State and local agencies conduct members of the IWG-HABHRCA for recommendations to assist their communities with their own resilience to HAB and hypoxia events. The IWG-HABHRCA is highly responsive to current HAB and hypoxia events, meeting biweekly and often coordinating with the HAB and hypoxia community. The website is a database of important research and information: https://coastalscience.noaa.gov/science-areas/habs/habhrca/

"Overview of Participant Demographics"

Jennifer Day, *Regional Coordinator,* **NOAA | Great Lakes Regional Collaboration Team**

Day provided an overview of the participant demographics of those who registered to attend the workshop. One of the main goals of the workshop was to get to know who the players are in the region that are communicating during a HABs event. To assist in achieving that goal, a directory of everyone who registered for this workshop was provided.

A total of 70 people registered to attend the workshop with there being a well-rounded mix of personnel from federal, state, and other agencies. The two largest groups of registrants were from Michigan and Ohio respectively, with the rest being evenly distributed across the region. Of these respondents, 35 work on Lake Superior, 39 for Lake Michigan, 31 for Lake Huron, 58 for Lake Erie, and 24 for Lake Ontario (some respondents work on more than one lake).

Registrants were also asked what they would like to accomplish from participating in the workshop. The most common responses were networking and collaboration with others on HABs, best management practices (BMPs), tools, and skills for communication. People were also interested in knowing what others are doing for crisis and communication response and their other roles and responsibilities. Additionally, people wanted to know how their agency /

organization can best assist during HABs events. See Appendix E for the Workshop Participant Directory.

"HABs Survey Results"

Felix Martinez, *Program Manager,* **NOS | NCCOS**

Martinez discussed the results of the *2022 Great Lakes Harmful Algal Bloom Communication Preparedness Workshop Survey* that was managed by the UNH's Survey Center. The survey was sent to 157 people and 32 respondents completed the survey, resulting in a response rate of 20%. The survey report is located in Appendix D.

"Wisconsin Case Study Review"

Gina LaLiberte, *Statewide Harmful Algal Bloom Coordinator & Applied Limnologist*, **Wisconsin | Department of Natural Resources**

LaLiberte described past experience with algae bloom events. In 2021 a never before observed event in Lake Superior proved critically and environmentally damaging. She described the communication strategy and the impacts to humans and the environment, and the necessity for good communication messaging that was needed to describe the severity of the problem. It was necessary to close public beaches. Outreach events were conducted in schools, public venues, and on public radio to teach and train about algae bloom, toxins and how beach goers could report what they observed.

"Toledo (OH) Case Study Overview"

Shannon Nabors, *Chief Environmental Administrator,* **Ohio | Environmental Protection Agency**

Nabors shared details of the 2014 Toledo HAB event. Outlining the evolution of HAB response in Ohio, including response strategies, drinking water advisories, and guidance for recreational water use, as well as sampling collections and laboratory protocols. She noted that toxins can quickly overwhelm water treatment plants. Ohio EPA had protocols in place and with around the clock staffing were able to provide advisories, alternative water supplies, and improved operational measures to better isolate contamination. Some recommendations from their lessons learned were to identify critical users/susceptible populations, distribute modeling and sampling plans, and describe procedures for flushing lines. This also provided an opportunity to update communication plans and signs, as well as public notification templates. The multi-agency coordination and communication guidance was an important asset for public awareness and understanding.

C. Breakout Group Discussions Day 1

There were two breakout group sessions on Day 1 with four groups for each session. The two breakout sessions were each focused on the two case studies that participants were asked to watch videos about prior to the workshop. The sets of questions posed to the participants were the same across the two sessions: (1) have you faced a similar situation in your area, (2) how would this have played out in your area, (3) what went right and why, (4) what went wrong and why, (5) what changes could be made for next time, and (6) what lessons did you learn from this? A compilation of all breakout group notes can be found in Appendix C.

Highlights from this discussion included the importance of distinguishing clear roles and responsibilities for different types of communication and different audiences, and establishing

response based on the magnitude of the event (e.g., determining who to contact and when/when to bring in state entities, federal entities). NOAA is working on this tiered response, developing a 'bloom of national significance' criteria patterned off the 'spills of national significance'.

The Ohio Department of Higher Education created a research program driven by those who needed studies conducted rather than being driven by researchers ($2M awarded to Ohio institutions of higher education for applied research, after EPA and public health agencies were contacted first).

Lack of trust post-event is a common issue with the public, even after the water is said to be safe. Research on chronic exposure takes longer, so it is important to say that studies are underway, but results are not yet available.

Wrap Up Comments

Day 1 concluded with wrap up comments by Ruth Briland (OH EPA) and Jennifer Day (NOAA) who both served on the steering committee.

D. Presentations Day 2

"Overview of Risk and Crisis Communication"

Katie Krushinski, *Emergency Response Planner,* **NOAA | Disaster Preparedness Program**

Krushinski defined terms commonly used in risk and crisis communication. Risk is the threat of loss, real or perceived, of that which we value. Risk is determined by the hazard multiplied by the consequence. Krushinski reviewed three common definitions of disasters in emergency management. Each definition explains that disasters are destructive, disruptive, and can overwhelm community resources. A crisis is a specific unexpected and non-routine event or series of events that creates high levels of uncertainty and threatens an organization's high priority goals. Emergencies, disasters, and catastrophes are often used interchangeably, but differ regarding their impacts, geographic extent, pre-incident planning, response resources, public involvement, and recovery. For example, the public is not generally involved in response during an emergency. However, during disasters, the public is extensively involved in response. During catastrophes, the public is extensively involved in response and long-term recovery efforts.

Risk communication is a science-based approach for communicating effectively in a high concern environment that includes low trust, a sensitive topic, and/or a controversial situation. It is focused on what might happen (e.g., an approaching hurricane) and is the exchange of information about the nature of the risk and risk management options.

There are three goals for risk communication: 1) increase knowledge and understanding by providing clear, concise, and science-based information, 2) enhance trust with the audience, and 3) resolve conflicts quickly as they occur. Crisis communication is the exchange of risk-relevant and safety information during or after an emergency. It is focused on what has already happened (e.g., a hurricane has hit). Crisis communication is message driven, using rapid response communications from external/public affairs staff.

An individual's perception of risk can be influenced by experiences, socioeconomic factors, and the availability of information. People often compare disasters and their impacts to experiences they previously encountered, sometimes making it seem like a lesser risk. Socioeconomic factors include, but are not limited to, employment, education, and income. They influence people's perception of risk from a hazard. It is important to understand that different populations comprise the intended audience when delivering messages.

There are four ways to build and maintain trust within an audience: 1) empathy, 2) honesty, 3) dedication, and 4) expertise. To build trust, a communicator needs to: acknowledge uncertainty, errors, deficiencies, and misbehavior; establish their own humanity; apologize early and often if mistakes are made; and avoid comparisons. To inform the public, it is important to: prepare at least three times the number of facts and figures that are needed; stay organized; dress appropriately; be concise, clear, and brief; develop key messages specific to stakeholders; and actively listen.

Krushinski emphasized that it is essential to communicate through social media. An organization should dedicate a staff member to post and handle rumor control during the event. The social media platforms used to share information should be based on the target audience and focus on sharing science-based information. Non-verbal actions provide more than half of message content when communicating. Audience members notice non-verbal cues immediately and can interpret them negatively. Non-verbal communication overrides verbal communication (e.g., Flint Michigan water crisis press conference where a speaker was drinking from a plastic water bottle). Krushinski concluded by stating the importance of knowing the audience, making a well written risk and crisis communication plan, and communicating early and often.

"Risk Communication: A Social Science Resource and Research Project"

Marybeth Bauer-Martinez, *Development Manager,* **Washtenaw County | National Alliance on Mental Illness**

Bauer-Martinez discussed how social sciences are integral to risk communication strategies and practices. *Harmful Algal Research and Response: A Human Dimension Strategy* is an interdisciplinary social science report focused on algal toxins and harmful algal blooms that covers the systems for reporting illnesses, socio-cultural impacts, economic benefits of forecasts, and risk communication. The guiding questions when it comes to communicating risk are:

- Who are the priority audiences?
- How can I learn about their experiences, perceptions, values, and concerns?
- What are your communication goals?
- How will I get to know my audience?
- What messages and strategies will work?

With these questions in mind, a risk communication strategy was developed for commercial fishermen in west central Florida. A focus group of local fishermen was used, and it uncovered that they lack trust in the scientific community feeling scientists are trying to generate more work for themselves. Additionally, the fishermen see HABs as a natural ecological process in which humans do not need to intervene. They feel marginalized by the decision-making process and that their knowledge is not used as it should be. Using this information, a set of communication goals was developed noting the importance of (1) providing "appropriate" information,

recognizing the ethos of HABs being “natural," (2) developing trust, and (3) fostering participation in decision-making with local knowledge.

Baur-Martinez emphasized that risk communication studies can inform design and implementation of messages and strategies. Focus groups are a good way to gain a nuanced, in-depth understanding of your audience to help craft effective communication messages and strategies.

“Everyday People and HABs Info”

David Fitch, *Communications Specialist,* **Great Lakes Observing System (GLOS)**

Fitch provided a review of the information system used by GLOS and the stakeholder assessments that were involved in the development of this system. The Seagull Platform is run and managed by the Great Lakes Observing System and has been in use for a year. Two main surveys provided important information upon which the system was based: Recreational User Survey and HAB Stakeholder Assessment.

The Recreational User Survey was conducted in 2021 to understand the recreational community, including people from boater groups (e.g., yacht clubs, Facebook groups, and marinas). The two questions that were proposed to the group were, *how do they get lake information* and *what would they like to see changed.* In total, there were 780 respondents with over 50% being the most interested in Lake Michigan. The results of this survey showed that 86% of people use apps to monitor lake conditions and they are looking for information such as wave height, wind speed and direction, wind gusts, water and air temperatures, and water currents. Recreational Users want: (1) a one stop shop location for information, (2) data presented in a format for non-experts, (3) more buoys, (4) more accuracy, and (5) better marketing of services.

The HABs Stakeholder Assessment was conducted in 2019 – 2020 and was a mixed mode survey targeting professionals, residents, and researchers. It asked how people receive HAB information, the impact of HABs, and the information they would like to know. The results of the survey showed that users want: (1) information via email, (2) the current conditions and a 1 week forecast, (3) daily updates as things get bad for health / recreation, (4) information from NWS and other NOAA sources, and (5) information should come to them instead of having to search for it.

Fitch ended with the key takeaways being that in order to communicate well, we have to keep a pulse on the people. The information should be kept simple, tailored to the users, and be a ‘one stop shop’ location. Asking the people what they want, and need will always prove better than guessing.

Existing HABs Plans, Policies, and Procedures

Participants of the Communication Preparedness Survey were asked if they would be willing to share and present their organization’s plans, policies, and procedures related to HABs communications. At the time of the survey, there were four participants that said they would be willing to present. Based on availability and relevance, two individuals presented at the workshop.

"Public Health Muskegon County (MI)"

Aabir Banerji, USEPA and Michael Eslick of Public Health Muskegon County (PHMC) shared the organization's *Harmful Algae Bloom Response Procedure*. Eslick first provided some history on PHMC's involvement in HABs and then explained the procedures in detail. PHMC was first called to respond to a HABs event in 2019 when there was no funding available from either the state or federal government. There was little HABs training available, coordination of events was lacking, and no procedures were in place for response. All of this made the understanding of what needed to be done very unclear, generating the need for a procedure.

PHMC had an *E. coli* beach monitoring procedure for over a decade, but this did not include HABs. In order to create a HABs procedure, PHMC needed a better understanding of HABs. The *E. coli* events are much different than a HAB. A formal HABs procedure was established in 2022. A stakeholder listing was created and is updated annually and includes county administrators, county board of commissioners, township or city administrators, park administrators, and news agencies. When a complaint/alert is received by Environmental Health (EH), the Health Department Administration is alerted, and designated staff send an email to the stakeholders tailored to the event. Public notice is issued by a PHMC Emergency Coordinator. These procedures are reviewed annually. Additionally, the procedures include having the PHMC - EH staff trained to take initial HAB samples and PHMC, Great Lakes & Energy (EGLE) send in samples to the Bureau of Labs.

During the busy season of 2022, the procedure was activated at three sustained HABs locations: Muskegon Lake, White Lake, and Spring Lake. Some of the lessons learned/ items for review include: how often ongoing events should be sampled, when should a posting or alert be modified, what to do if an event remained until sampling stops for the season, when should public notice be issued and lifted, how do we know the public has appropriate knowledge of the event, and is enough being done?

E. Breakout Group Discussions Day 2

There was one breakout session on Day 2 with four breakout groups. This was a guided discussion that focused on communication with the following questions answered: (1) how do you communicate across the different levels of government during a HABs event, (2) how do you communicate to the stakeholders or end users, (3) how could communication be improved, and (4) based on the presentations today, what is one key thing that you learned and how might this help you moving forward? A compilation of the breakout group notes can be found in Appendix C.

The need to communicate across the different levels of government during an event was well documented in this discussion. Additional discussion encouraged communicators to be sure that the information and level of content regarding an HAB event is appropriately and adequately tailored to the audience. Communication methods must reach a variety of audiences to be each effective and appropriate. Outreach documents must be in different languages to address information and language barriers. Some found it helpful to take a training course in crises communication in order to learn how to be more effective. A final key takeaway was to encourage rapid response in taking samples and have researchers readily available for speedy scientific assessments.

VI. Workshop Outcomes and Recommendations

The main goal of this workshop was to use the results of the survey, the expertise of the participants, the ideas generated by the use of breakout groups, and the lessons learned from the case studies to distill recommendations to develop a HABs communication strategy for the Great Lakes. A list of recommendations and suggested communication best practices intended to help achieve this goal follows.

A. Recommendations

- Develop a HAB communications guide that can be shared across local, state, and federal agencies.
    - With the understanding that not all HAB events across the region will be identical, the guide will provide information on a minimum number of activities that would be considered essential to an effective communication strategy (e.g., a decision flow chart on when and how to respond to HAB events).
    - The guide should also provide a list of key regional event communication points of contact who will help in coordination of efforts for blooms that cross jurisdictional boundaries and allow continued sharing of lessons learned from future HAB events.
- Identify an entity that can serve as a formal regional HAB Communications Hub
    - The objective of the regional communication hub should be to facilitate both interstate and interagency collaboration and coordination on communication related to HAB events. The facilitation should apply to internal and external communications.
    - The Hub should regularly assess and promote information services and products that are used to provide public alerts or information on the presence and extent of HABs across the region.
- Government agencies responsible in addressing HAB issues should promote and encourage engagement of agency staff with communication specialists through:
    - In-person participation at relevant meetings and conferences, and, where possible, provide options to attend virtually.

B. Best Practices

The use of communications strategies about the status and impacts of HAB events internally within agencies, and externally among agencies and between an agency and stakeholders will vary according to the specific information needs and the type of information being conveyed. During the workshop, two key best practices were identified to help HAB communications across the Great Lakes region.

- Agencies should incorporate information from focus groups of target audiences and stakeholders into the design process of communication tools. If not possible, opportunities should be provided for groups to review tools.
- Agencies, along with other key entities working on HAB issues, should collaborate across the region to ensure consistency in messaging, as well as in the style of communication materials and graphics. In particular, agencies should share examples of

drafts of materials and the edits that tailored the content to a particular message (e.g., language translation, acronyms).

VII. Next Steps

Through the last few decades, great strides have been made in understanding the factors that fuel the formation and persistence of HABs in the Great Lakes. Nevertheless, state and federal agencies still struggle to achieve consistently good results when it comes to preventing their formation, controlling their extent, or mitigating their effects. Hence, major (e.g., Toledo drinking water crisis) and minor (e.g., temporary beach closures) HABs impacts continue to be a public threat. Until such time as agencies can effectively control HABs and prevent their formation, communication with their stakeholders will be a critical task. Release of proper, timely information will allow Great Lakes residents impacted by HABs to respond to their impacts by decreasing risk to their health when consuming resources such as drinking water and recreating in the lakes.

The findings and recommendations of this workshop are not binding. However, showcasing of the value of effective communication and the role that a well-informed public can inspire in development and implementation of response strategies. It will also demonstrate that consistent, well-coordinated messaging is an integral tool of addressing HABs in the Great Lakes. Relevant agencies and organizations in the region are encouraged to use the proceedings and recommendations of this workshop to formalize a region-wide, lake-specific, Great Lakes HAB Communications Strategy and create a Great Lakes Communication Hub.

VIII. Appendices

A. Workshop Agenda
B. Workshop Presentations
C. Discussion Breakout Group Notes
D. Communication Preparedness Workshop Survey
E. Participant Directory

Appendix A: Workshop Agenda

Great Lakes Harmful Algal Bloom (HAB)

Communication and Preparedness Workshop

January 17-18, 2023

1:00 – 5:00 PM (ET)

AGENDA

January 17, 2023 (Day 1)

1:00 Opening, Overview, and Logistics

- *Nancy Kinner, Coastal Response Research Center, University of New Hampshire*

1:05 Introduction

- *Rachel Pryor, National Oceanic and Atmospheric Administration*

1:15 HABHRCA Overview

- *David Kidwell, National Oceanic and Atmospheric Administration*

1:20 Overview of Participant Demographics

- *Jennifer Day, National Oceanic and Atmospheric Administration*

1:25 Survey Results – HABs

- *Felix Martinez, National Oceanic and Atmospheric Administration*

1:30 Wisconsin Case Study Review

- *Gina LaLiberte, Wisconsin DNR*

1:40 Case Study Discussion, Breakout Groups – Wisconsin

2:30 Case Study Discussion Report Out

3:10 BREAK

3:20 Toledo Case Study Review

- *Shannon Nabors, Ohio EPA*

3:30 Case Study Discussion, Breakout Groups – Toledo

4:15 Case Study Discussion Report Out

4:50 Wrap Up

- *Ruth Briland, Ohio EPA*
- *Jennifer Day, National Oceanic and Atmospheric Administration*

5:00 *ADJOURN DAY 1*

January 18, 2023 (Day 2)

1:00 Opening, Overview, and Logistics

- *Nancy Kinner, Coastal Response Research Center, University of New Hampshire*

1:05 Overview of Risk + Crisis Communication

- *Katie Krushinski, National Oceanic and Atmospheric Administration*

1:35 Risk Communication: A Social Science Resource and Research Project

- *Marybeth Bauer-Martinez, National Centers for Coastal Ocean Science*

1:55 Everyday People and Habs Info

- *David Fitch, Great Lakes Observing System*

2:15 Existing HABs Plans, Policies, and Procedures

- *Aabir Banerji, US EPA*
- *Michael Eslick, Muskegon County Public Health*

2:45 BREAK

2:55 Communication Breakout Groups

3:55 Communication Report Out

4:40 Wrap Up

- *Felix Martinez, National Oceanic and Atmospheric Administration*
- *Chris Winslow, Ohio Sea Grant*
- *Rachel Pryor, National Oceanic and Atmospheric Administration*

5:00 *ADJOURN DAY 2*

Appendix B: Workshop Presentations

https://crrc.unh.edu/resource/GL_HABS

Great Lakes Harmful Algal Bloom (HAB) Communication & Preparedness Workshop

Start Time = 1 PM ET (12 PM CT)

Great Lakes HAB Workshop

Nancy E. Kinner, Facilitator
Coastal Response Research Center (CRRC)
University of New Hampshire

January 17 – 18, 2023

COASTAL RESPONSE RESEARCH CENTER

- Partnership between NOAA's Office of Response and Restoration and the University of New Hampshire
- Since 2004
  - UNH Co-Director – Nancy Kinner
  - NOAA Co-Director – Troy Baker

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- Conduct and Oversee **Basic** and **Applied** Research and Outreach on Spill and Other Environmental Disaster Response and Restoration
- Transform Research **Results into Practice**
- Serve as **Hub for Spill and Environmental Disaster R&D**
- **Facilitate Interaction** Among Spill/Environmental Disaster Community (All Stakeholders)
- **Educate/Train Students** Who will Pursue Careers in Spill Response and Restoration

HOW TO PARTICIPATE

- Please keep your microphone muted upon entering the Zoom webinar
- Please turn off your video unless you are speaking
- We invite your active participation by submitting questions or comments via the Chat
- If you have any access issues, please contact Kathy at kathy.mandsager@unh.edu or cell 603.498.8010

AGENDA

January 17, 2023 (Day 1)

1:00 Opening, Overview, and Logistics

1:05 Introduction

- *Rachel Pryor, NOAA*

1:15 HABHRCA Overview

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3:25 Toledo Case Study Review

- *Shannon Nabors, Ohio EPA*

3:40 Case Study Discussion, Breakout Groups – Toledo

4:25 Case Study Discussion Report Out

4:50 Wrap Up

- *Ruth Briland, Ohio EPA*
- *Jennifer Day, NOAA*

5:00 *ADJOURN DAY 1*

STEERING COMMITTEE

- **Nancy Kinner,** *Coastal Response Research Center*
- **Charlie Henry,** *NOAA*
- **Ruth Briland,** *Ohio EPA*
- **Jennifer Day,** NOAA
- **Regan Errera,** *NOAA*
- **Tony Marshak,** *NOAA* *(until Dec. 2022)*
- **Felix Martinez,** *NOAA*
- **Rachel Pryor,** *NOAA*
- **Chris Winslow,** *Ohio Sea Grant*

Questions?/ Comments?

http://crrc.unh.edu/

Great Lakes Harmful Algal Bloom Communication and Preparedness Workshop

LCDR Rachel Pryor, Scientific Support Coordinator
National Oceanic and Atmospheric Administration
Office of Response & Restoration

January, 2023

Photo: NOAA

University of New Hampshire
Coastal Response Research Center and Center for Spills and Environmental Hazards

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Coastal Response Research Center

Harmful Algal Bloom (HAB) Preparedness & Response Workshop

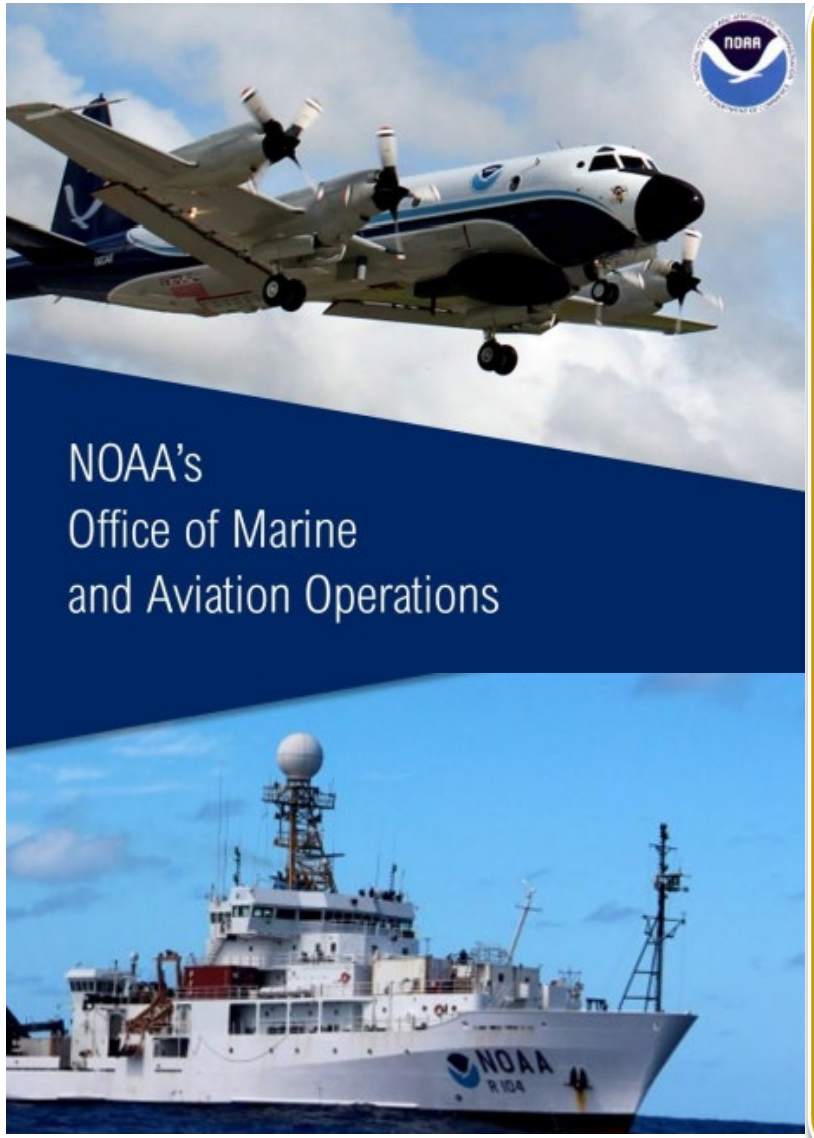
Tuesday, April 27, 2021 to Wednesday, April 28, 2021
A Virtual Event

US EPA Region 10 CyanoHABs Workshop and Tabletop Exercise (TTX)

October 17 and 18th, 2019

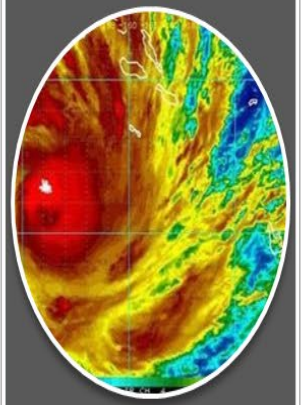
Seattle, Washington

NOAA Line Offices



National Weather Service (NWS)

Oceanic and Atmospheric Research (OAR)



National Environmental, Satellite, Data, & Information Service (NESDIS)

National Ocean Service (NOS)

National Marine Fisheries Service (NMFS)

Agenda

Day 1

- **Introduction about the workshop and the participants**
- **Case studies and break out groups**

Day 2

- **Communication focused**
- **Panel on existing HABs Plans, Policies and procedures**

NOAA GREAT LAKES

Improving NOAA's service to the Nation through collaboration

Overview of Participant Demographics

Jennifer Day

January 17, 2023

NOAA's Great Lakes Regional Team

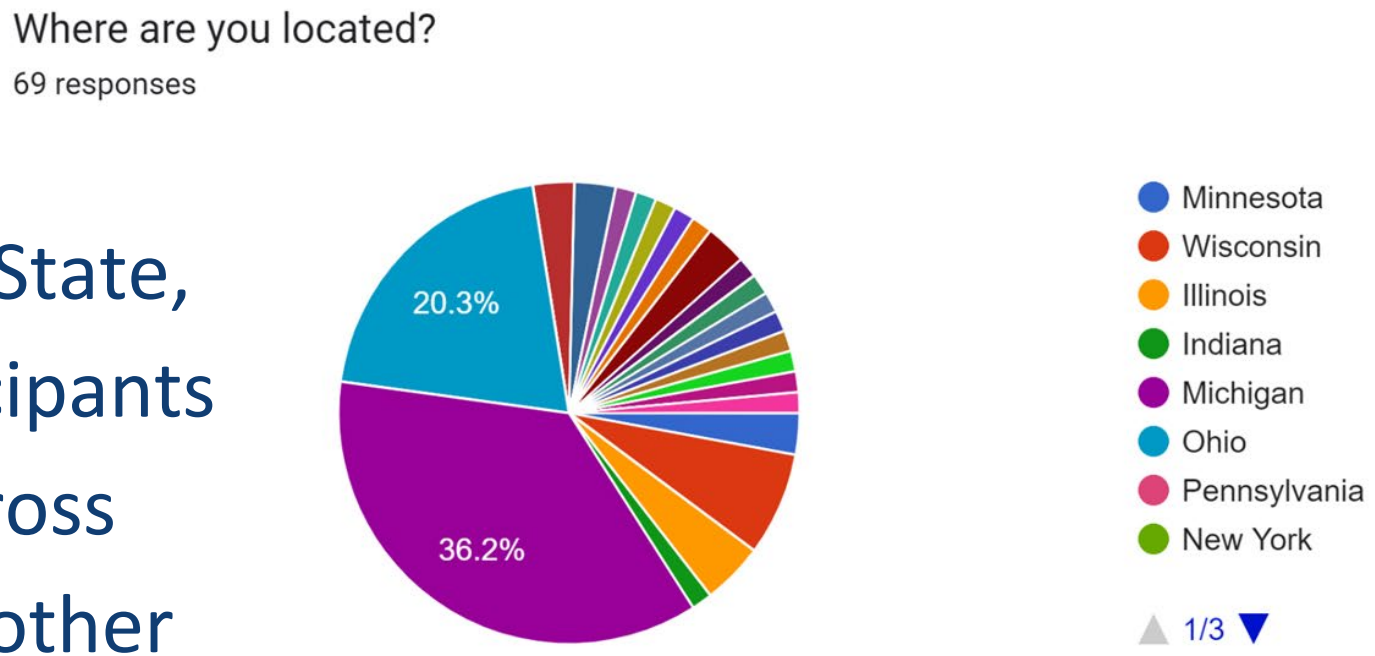
- Regional Coordinator
- Great Lakes Regional Collaboration Team
- Mission: To identify, communicate, and respond to regional needs, catalyze collaboration, and connect people and capabilities to advance NOAA's mission and priorities
  - Addressing regional challenges by connecting people and resources
  - Exchanging both national and regional insights that can inform action
- This workshop born out of the need to bring local, state and federal folks together on how we communicate about and during HAB events in the Great Lakes.

Getting to know each other

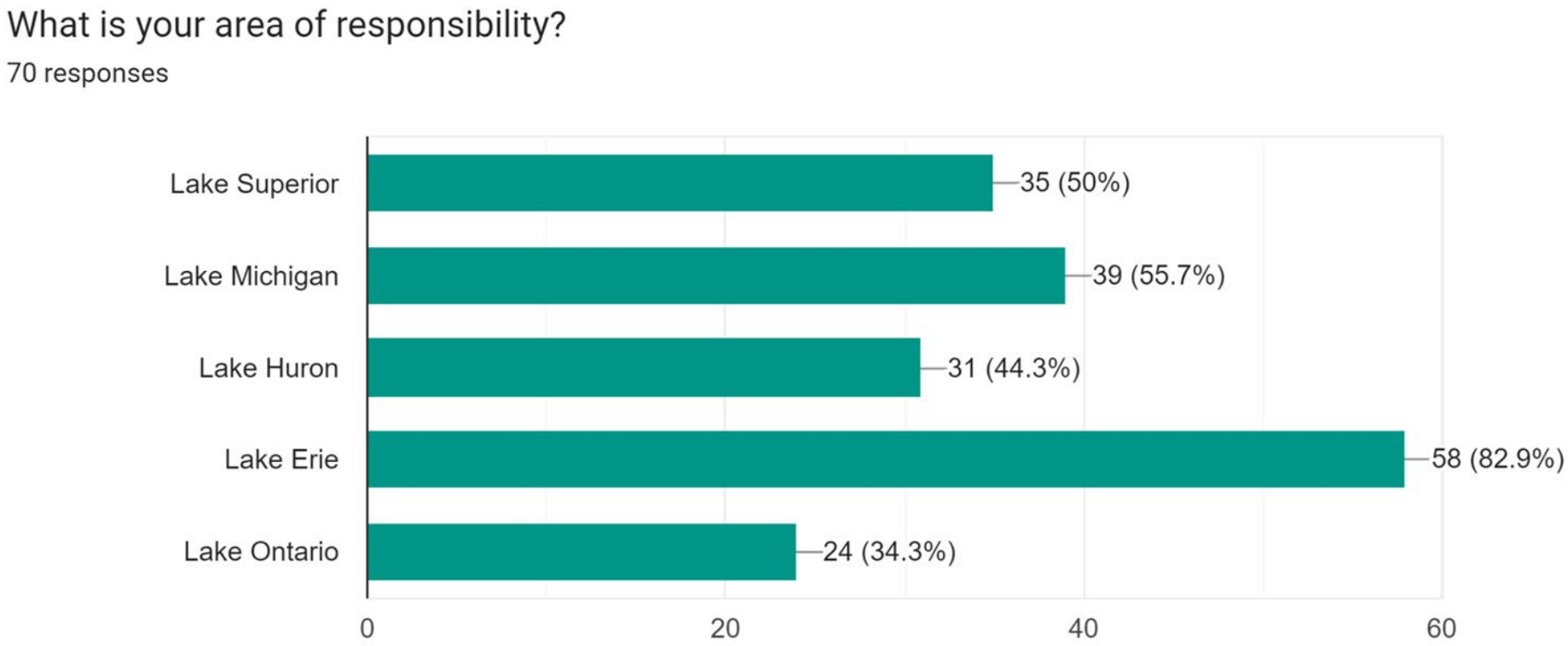
- A **goal** of this workshop is to get to know each other, or at least get a sense of the folks in our region communicating during HAB events
- **NOT** spending half our time on Introductions
- **ARE** providing a directory of everyone who registered for this workshop
- Feel free to **reach out** to each other and create your own network and continued discussion

Who we are …

- 70 Attendees
- Good mix of Federal, State, Local and other participants
- Participation from across the region and a few other locations outside the region, but cover the region



What lake do you work on …



What do we want to get out of it?

1. Ensure effective coordination and communication across local, state, and federal governments, and other relevant entities
    1. Compile and review existing plans, policies and procedures about effectively communicating HAB threats, including benthic and nuisance blooms, across relevant agencies;
    2. Determine the points of contact (POC's) responsible for HAB event preparedness and response.
    3. Create a process(es) for sharing information among relevant entities that ultimately reaches stakeholders and the public in a unified message.
2. Understand lessons learned from case studies (e.g., Lake Erie) and their relevance to emerging HAB locations (e.g., Lake Superior); and apply them to current and emerging threats.

What you want to get out of it?

- Networking and collaboration with others on HABs
- BMP, tools and skills for communication
- Crisis and communication response - what are others doing
- Becoming better prepared
- Communication knowledge and understanding
- Roles and responsibilities
- How can my agency, organization or department assist
  - Discussion of research, observations/testing, science, solutions, economic costs, understanding HABs - **not doing this**

Lake Superior

2021 HAB event: communication strategy and lessons learned

Gina LaLiberte

Wisconsin Department of Natural Resources

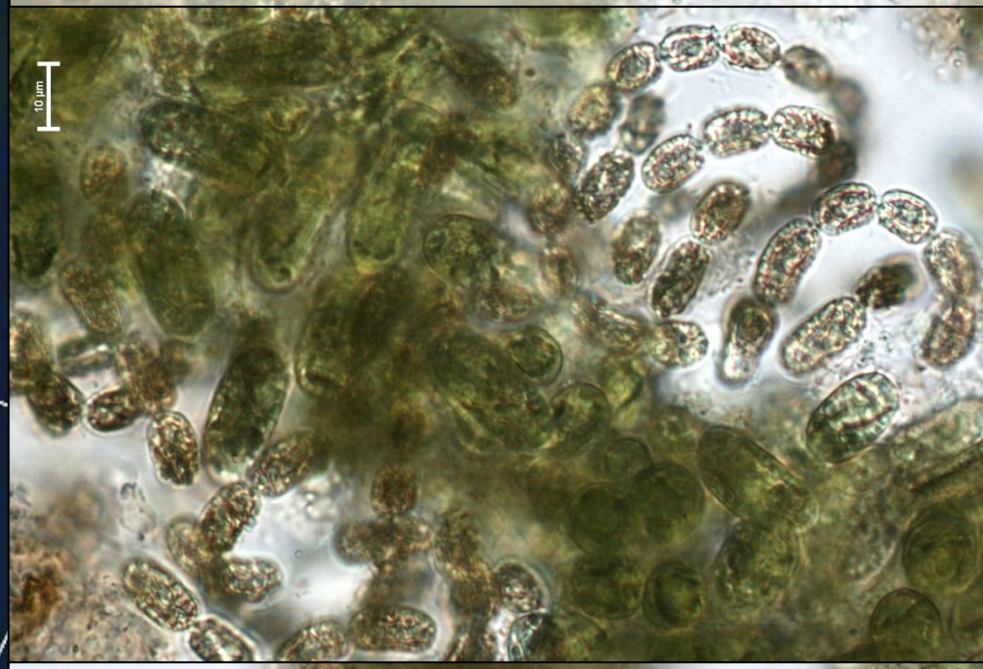
Gina LaLiberte - WDNR

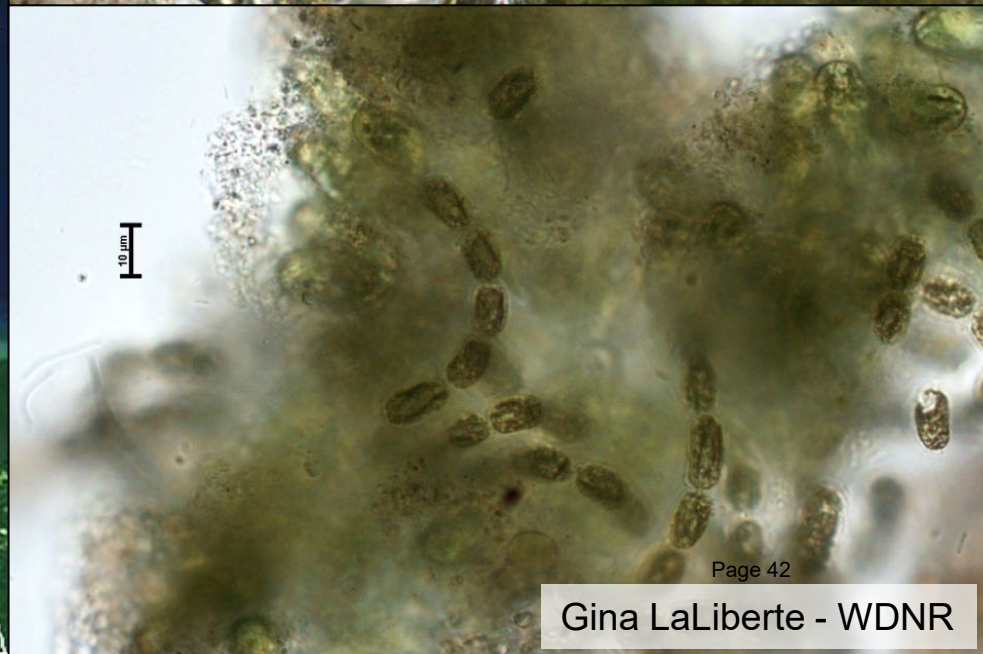
B. Moraska Lafrancois - NPS

Sediment plumes from June 19-20 storms.
Arrow is bloom sample location on July 15.

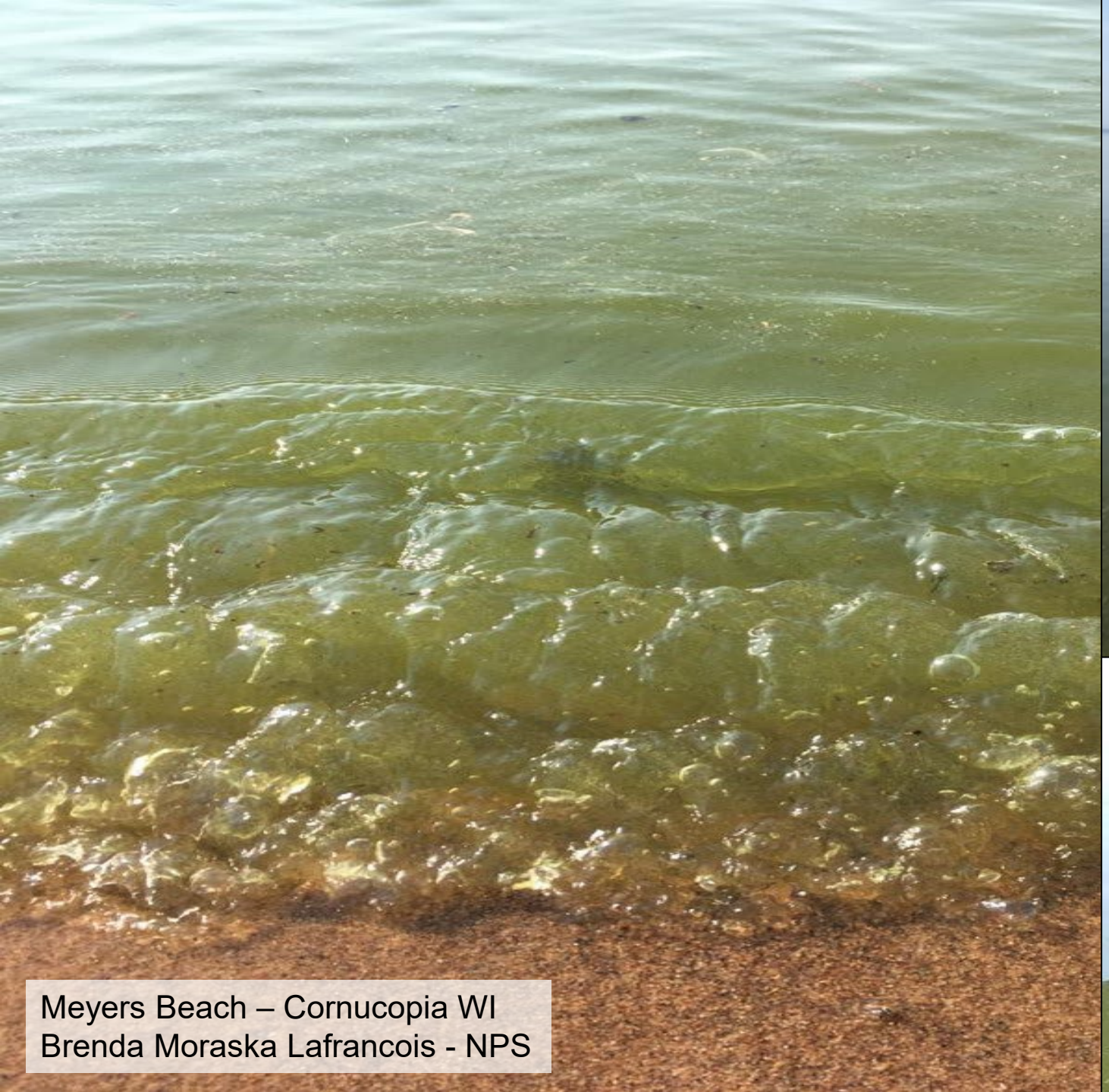
NOAA MODIS July 1, 2012

July 15, 2012:
Dolichospermum lemmermannii





Gina LaLiberte - WDNR

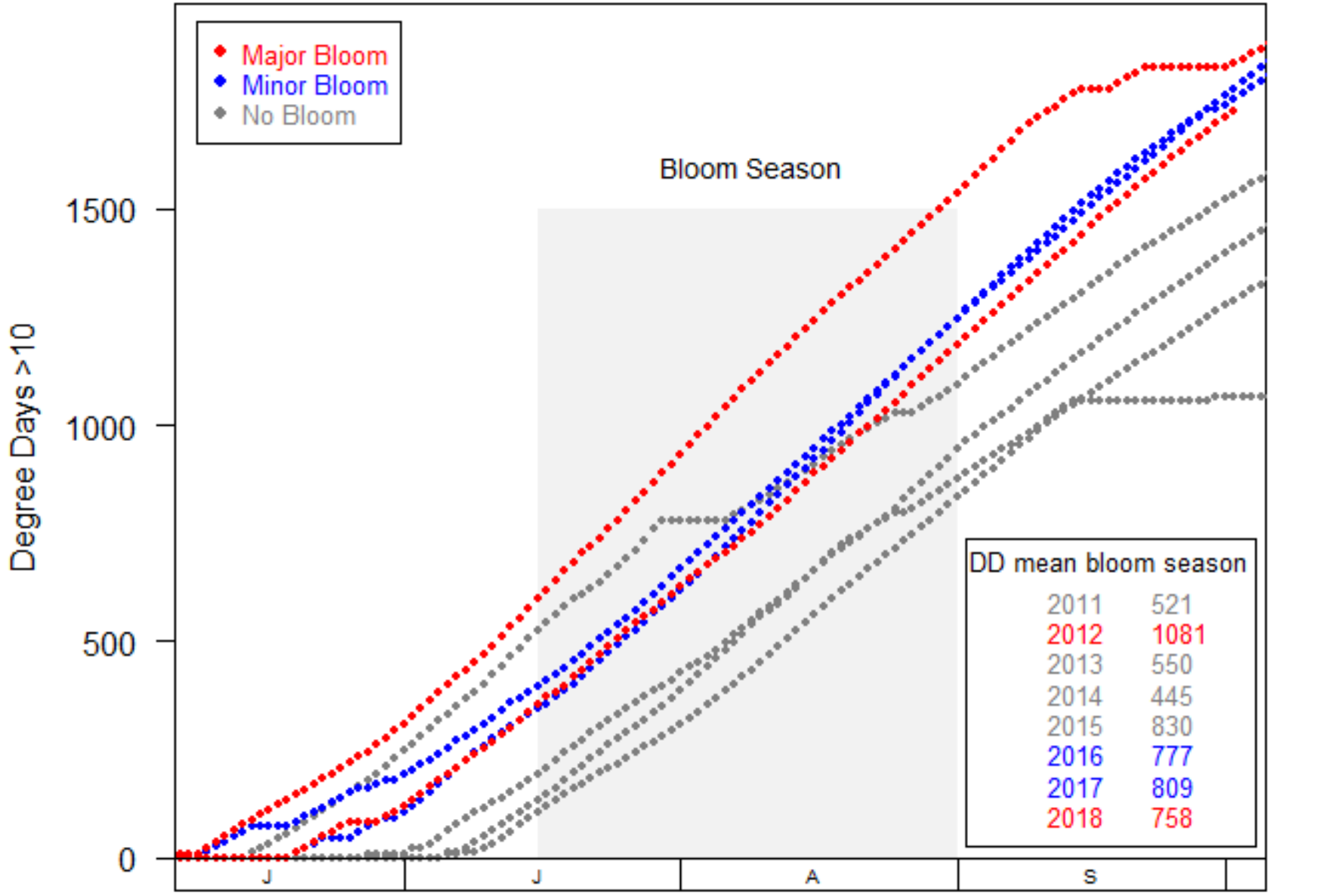


Meyers Beach – Cornucopia WI
Brenda Moraska Lafrancois - NPS

Meyers Beach – Cornucopia WI
Brenda Moraska Lafrancois - NPS

Sea Caves – Apostle Islands NL
Brenda Moraska Lafrancois - NPS

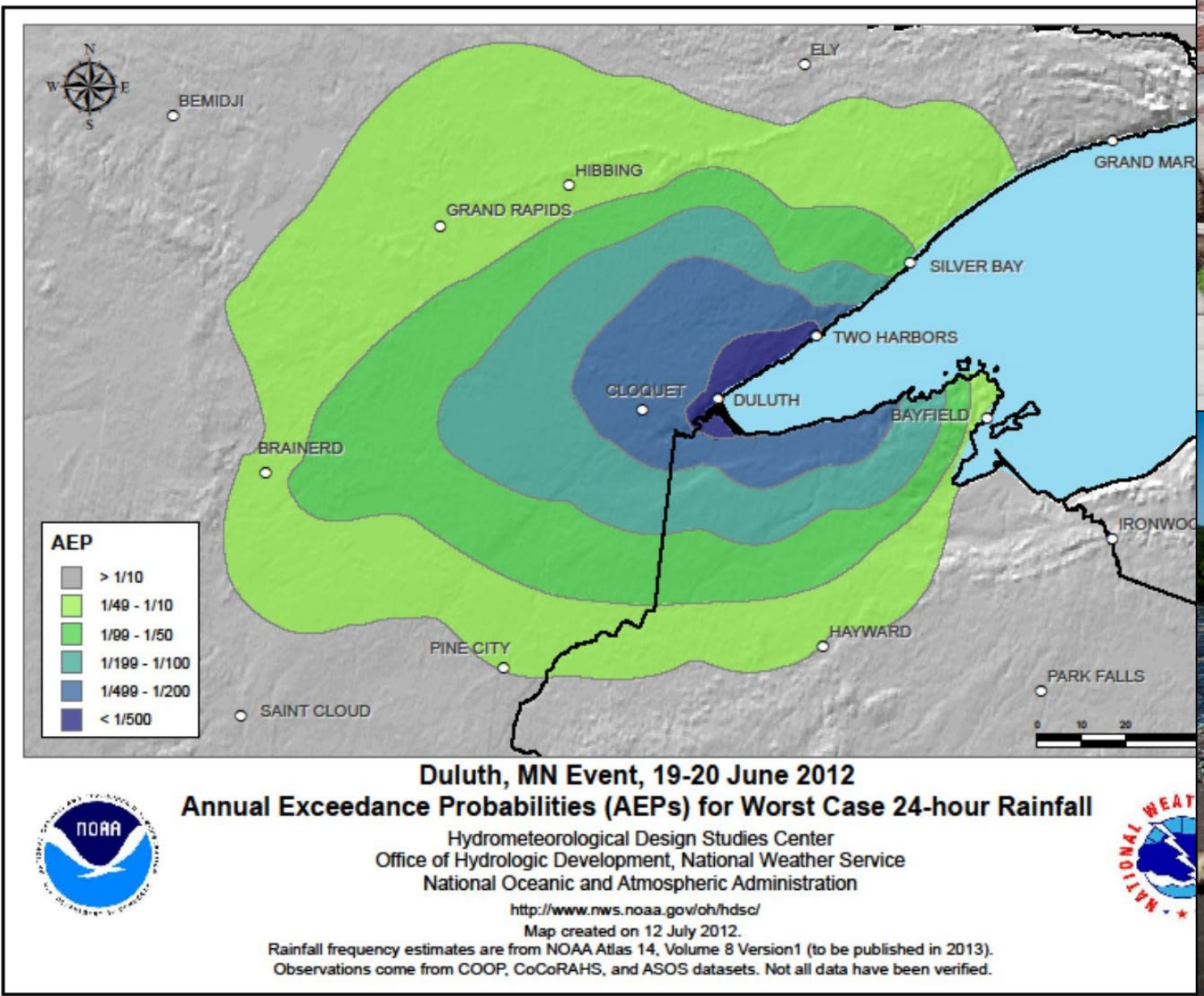
Degree days (> 10 C) shows clearly how blooms occurred in warm years.



Slide courtesy of Bob Sterner, University of Minnesota-Duluth

LARGE LAKES OBSERVATORY
UNIVERSITY OF MINNESOTA DULUTH
Driven to Discover

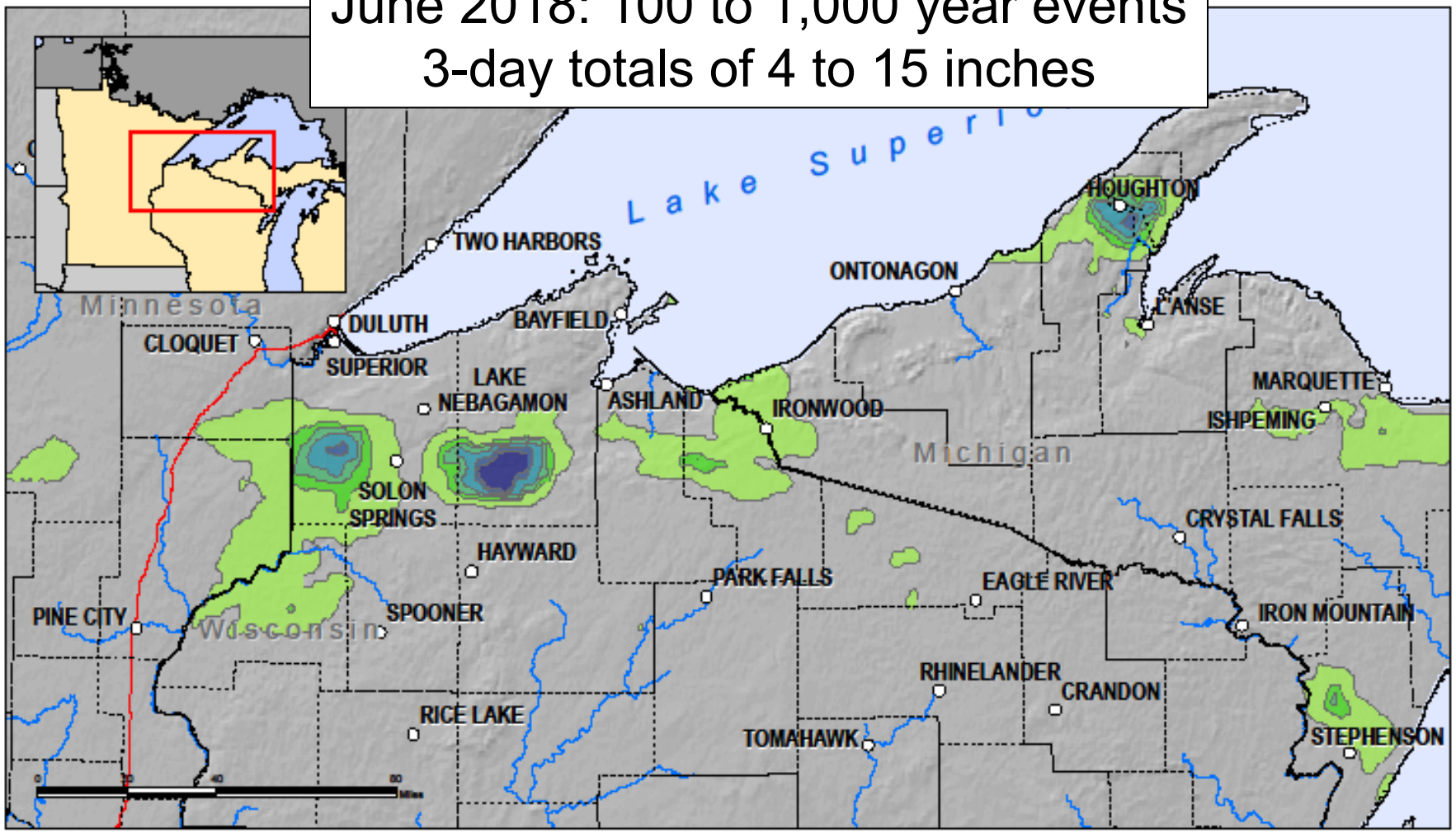
Duluth-Superior flooding June 19-20, 2012
7-10 inches of rain & 500-year storm event



Bob King, Duluth News Tribune

Derek Montgomery, Minnesota Public Radio

June 2018: 100 to 1,000 year events
3-day totals of 4 to 15 inches



Michigan and Wisconsin 14 - 18 June 2018
Annual Exceedance Probabilities (AEPs) for the Worst Case 6-hour Rainfall

Hydrometeorological Design Studies Center
Office of Water Prediction, National Weather Service
National Oceanic and Atmospheric Administration

http://www.nws.noaa.gov/ohd/hdsc/

Created 19 June 2018
Rainfall frequency estimates are from NOAA Atlas 14
Rainfall values come from 1-hour Stage IV data.

- 1/50 - 1/10
- 1/100 - 1/50
- 1/200 - 1/100
- 1/500 - 1/200
- 1/1000 - 1/500
- < 1/1000

WISCONSIN PUBLIC RADIO
Wisconsin and the World. npr

June 20, 2018

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WPR

U.S. Highway 63 near Drummond, Wisconsin. *Photo courtesy of the National Weather Service and Wisconsin State Patrol*

Once-In-A-Lifetime Rains Falling Frequently On Northern Wisconsin

Northwestern Wisconsin Has Seen 100-Year Rains Several Times In Last Decade

By Danielle Kaeding
Published: Wednesday, June 20, 2018, 2:00pm

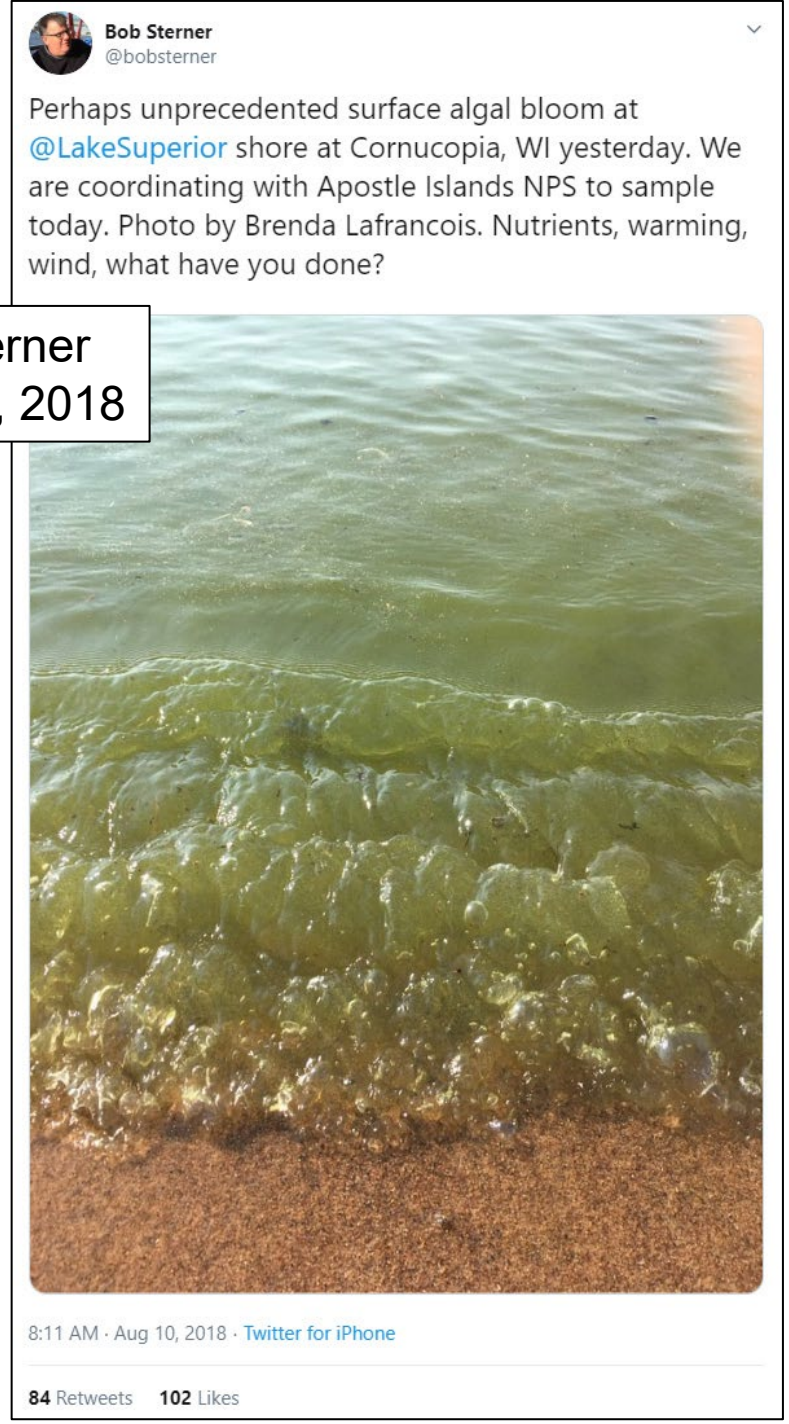
SHARE:

Listen Download

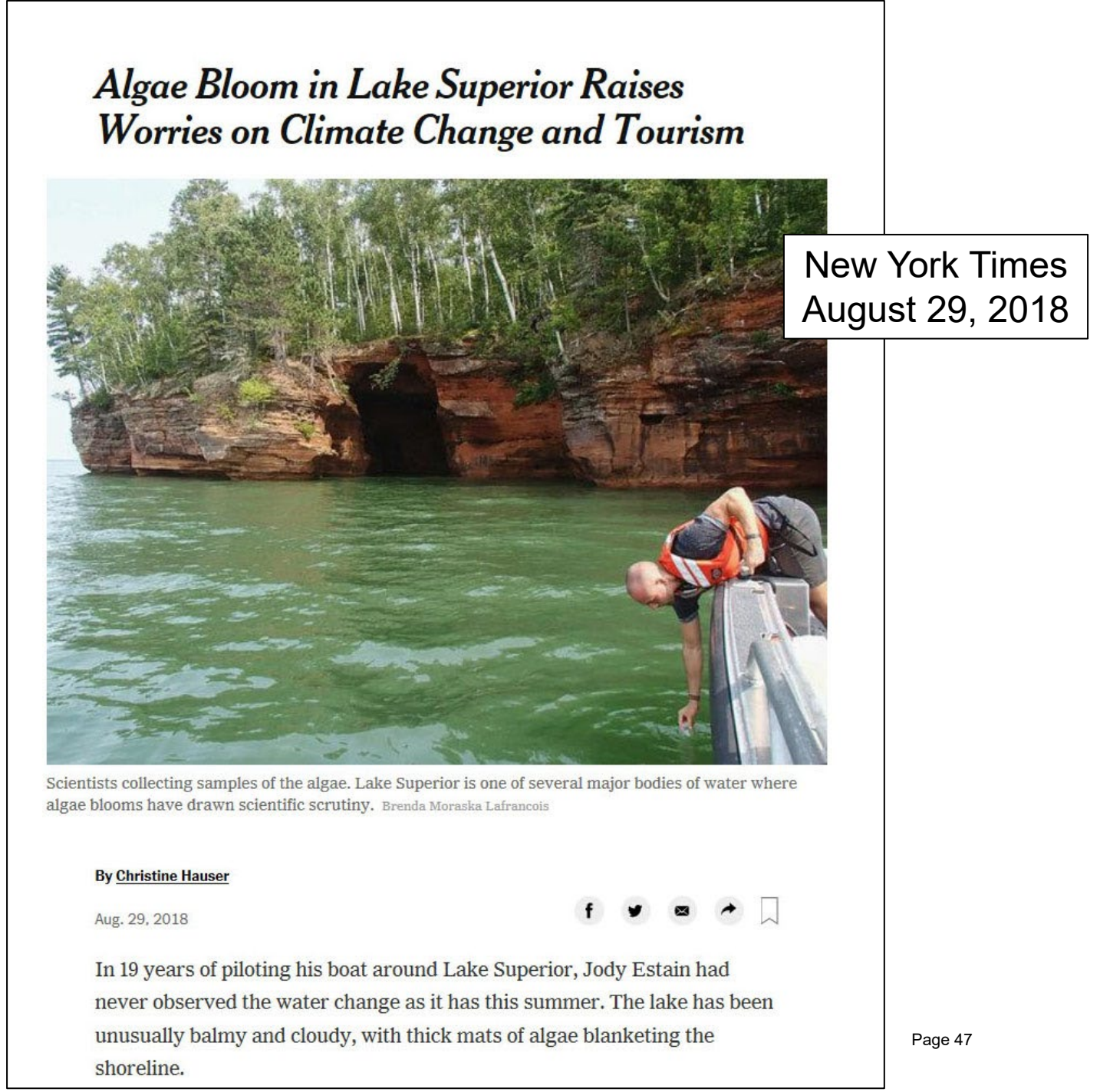
In the last decade, areas of northern Wisconsin have experienced several storms with heavy rains that are only projected to occur once in a lifetime, according to precipitation archives from the National Oceanic and Atmospheric Administration.

An official analysis of the weekend's storms in northern Wisconsin by NOAA confirms that 100 to 1,000-year rainfall events occurred in some areas of the state.

@bobsterner
August 10, 2018

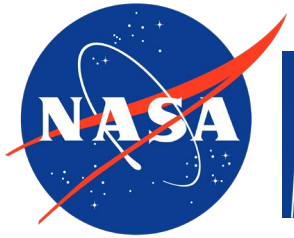


New York Times
August 29, 2018



Algal Bloom & Nutrients Subgroup






Environment and Climate Change Canada
Environnement et Changement climatique Canada



NORTHLAND COLLEGE
UMD
UNIVERSITY OF MINNESOTA DULUTH
Driven to Discover
UNIVERSITY of WISCONSIN
UWMILWAUKEE


UNIVERSITY of WISCONSIN
Superior

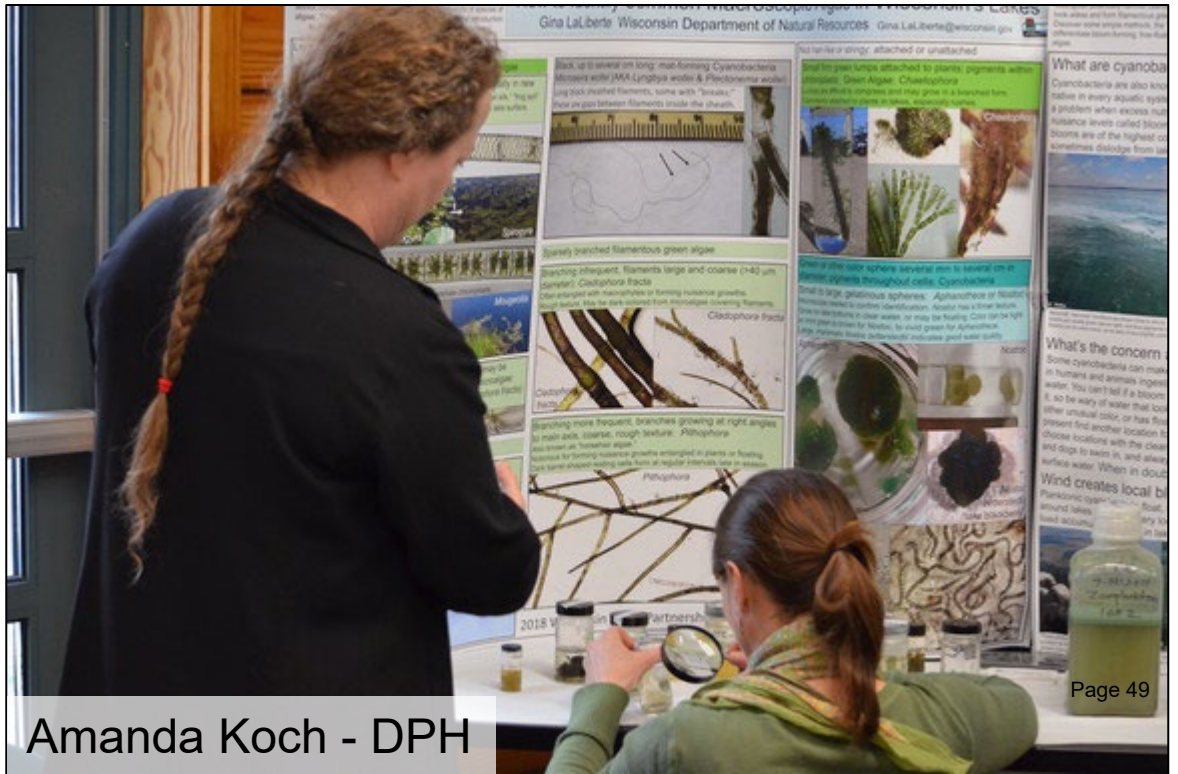

Cooperative Institute for Great Lakes Research
CIGLR
Great Lakes Science for Society


Public Health Outreach

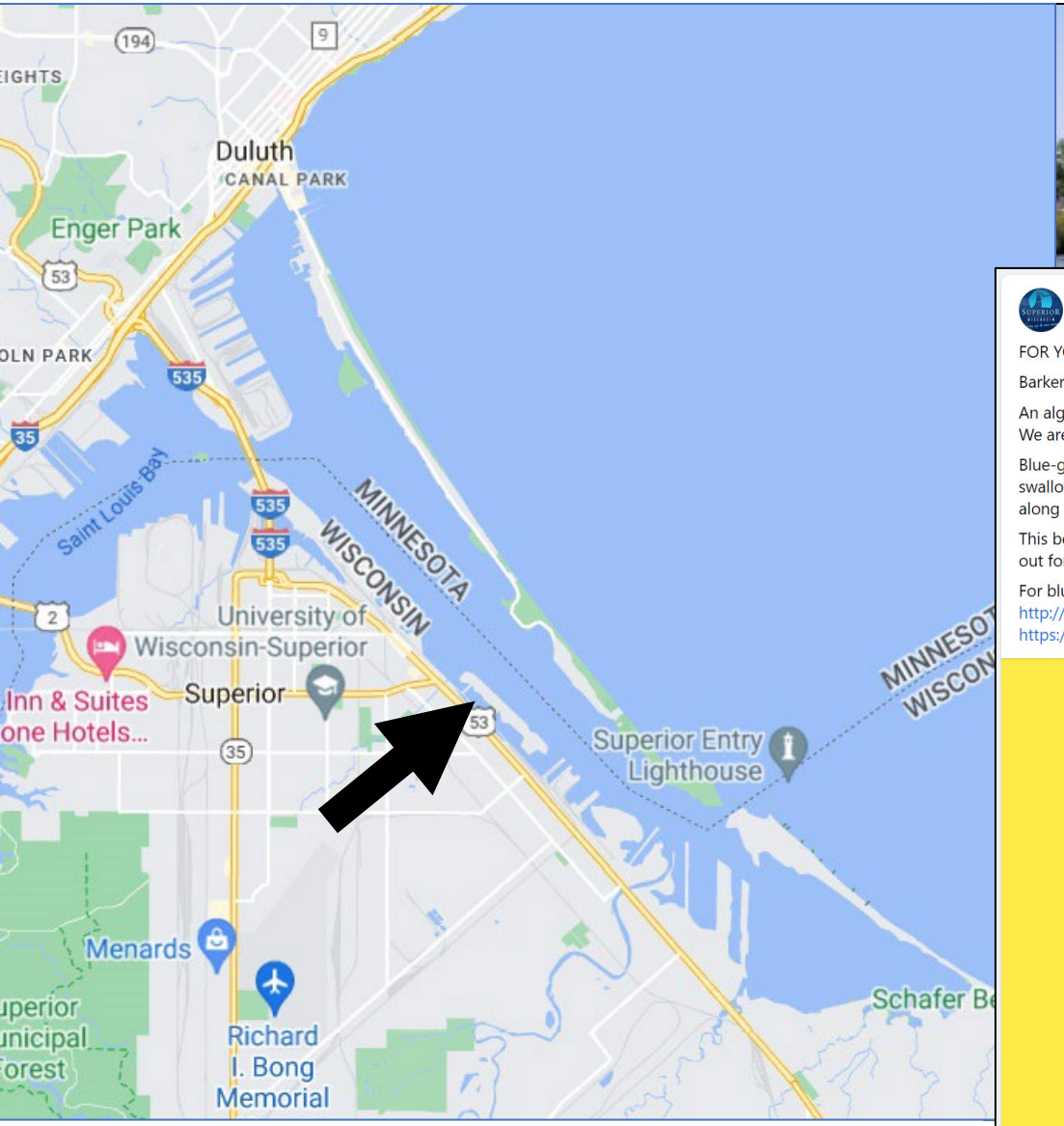
DPH Staff Funding

April 29, 2019 Blooms and the Big Lake Workshop with Wisconsin Division of Public Health and Lake Superior National Estuarine Research Reserve

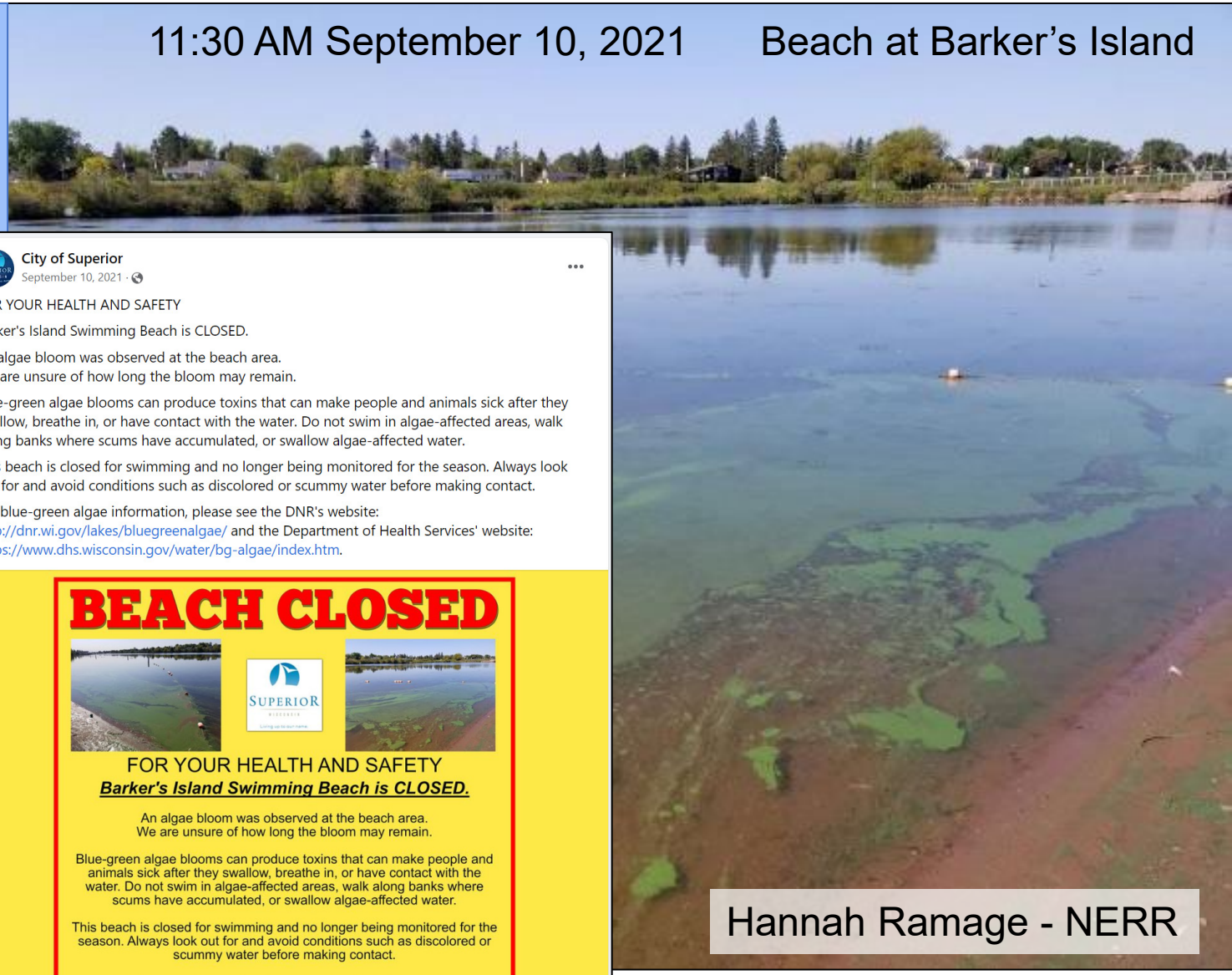
Amanda Koch - DPH



Amanda Koch - DPH



11:30 AM September 10, 2021 Beach at Barker's Island



City of Superior
September 10, 2021 ·

FOR YOUR HEALTH AND SAFETY

Barker's Island Swimming Beach is CLOSED.

An algae bloom was observed at the beach area.
We are unsure of how long the bloom may remain.

Blue-green algae blooms can produce toxins that can make people and animals sick after they swallow, breathe in, or have contact with the water. Do not swim in algae-affected areas, walk along banks where scums have accumulated, or swallow algae-affected water.

This beach is closed for swimming and no longer being monitored for the season. Always look out for and avoid conditions such as discolored or scummy water before making contact.

For blue-green algae information, please see the DNR's website: http://dnr.wi.gov/lakes/bluegreenalgae/ and the Department of Health Services' website: https://www.dhs.wisconsin.gov/water/bg-algae/index.htm.

4 21 shares

Like Comment Share

Hannah Ramage - NERR

WPR

A short-lived blue-green algae bloom was spotted on Friday, Sept. 10, 2021, at the Barker's Island beach area in Superior. *Photo courtesy of Hannah Ramage with the Lake Superior National Estuarine Research Reserve*

For The First Time, Toxins Found In Blue-Green Algae Bloom In Inlet Of Lake Superior

Officials Caution Findings Don't Indicate Harmful Blooms Will Form On Lake's Open Waters

By Danielle Kaeding

Published: Thursday, September 30, 2021, 5:50am

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Gina LaLiberte

Wisconsin Department of Natural Resources

gina.laliberte@wisconsin.gov

2014 Toledo HAB Event

Communication Strategy and Lessons Learned

NOAA HAB Workshop

January 2023

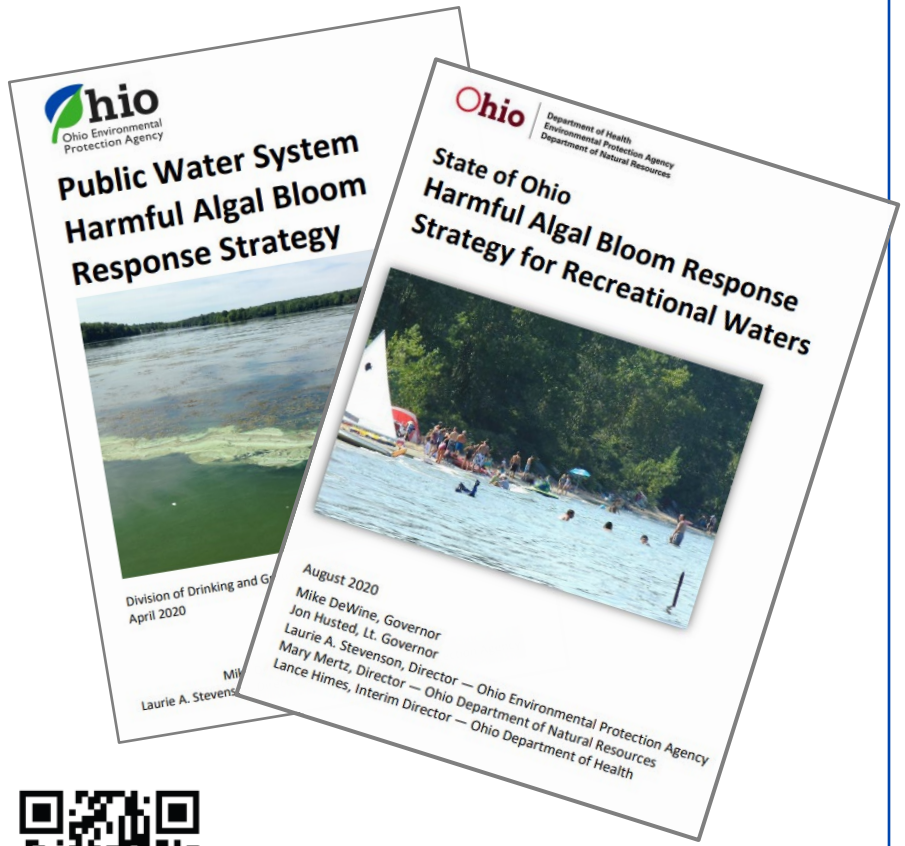
Shannon Nabors, Chief, Ohio EPA NWDO

Amy Klei, Chief, Ohio EPA DDAGW

Ohio Environmental Protection Agency

Evolution of Ohio HAB Response

- **2010**
  - Incidence Response Monitoring for HABs
- **2011**
  - First Ohio HAB Response Strategy
- **2013-14**
  - Drinking Water Advisories - Microcystins
  - Finished Drinking Water Detections - Saxitoxins
- **2015**
  - Ohio Senate Bill 1 Passed
  - U.S. EPA Drinking Water Guidance
- **2016**
  - HAB Rules for Public Water Systems
- **2019**
  - U.S. EPA Guidance for recreational water
- **2020**
  - Update Ohio HAB Response Strategies
- **2022**
  - Revised HAB Rules for PWS



ohioalgaeinfo.com

Ohio Environmental Protection Agency

Summer 2014 HAB Event- Western Basin Lake Erie Quickly Surrounds Toledo Intake Crib

Bloom July 31, 2014

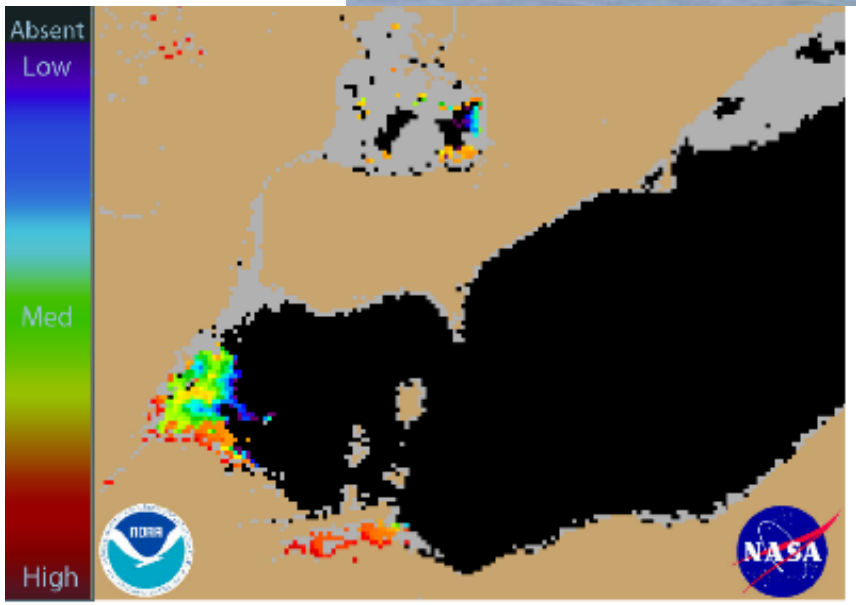
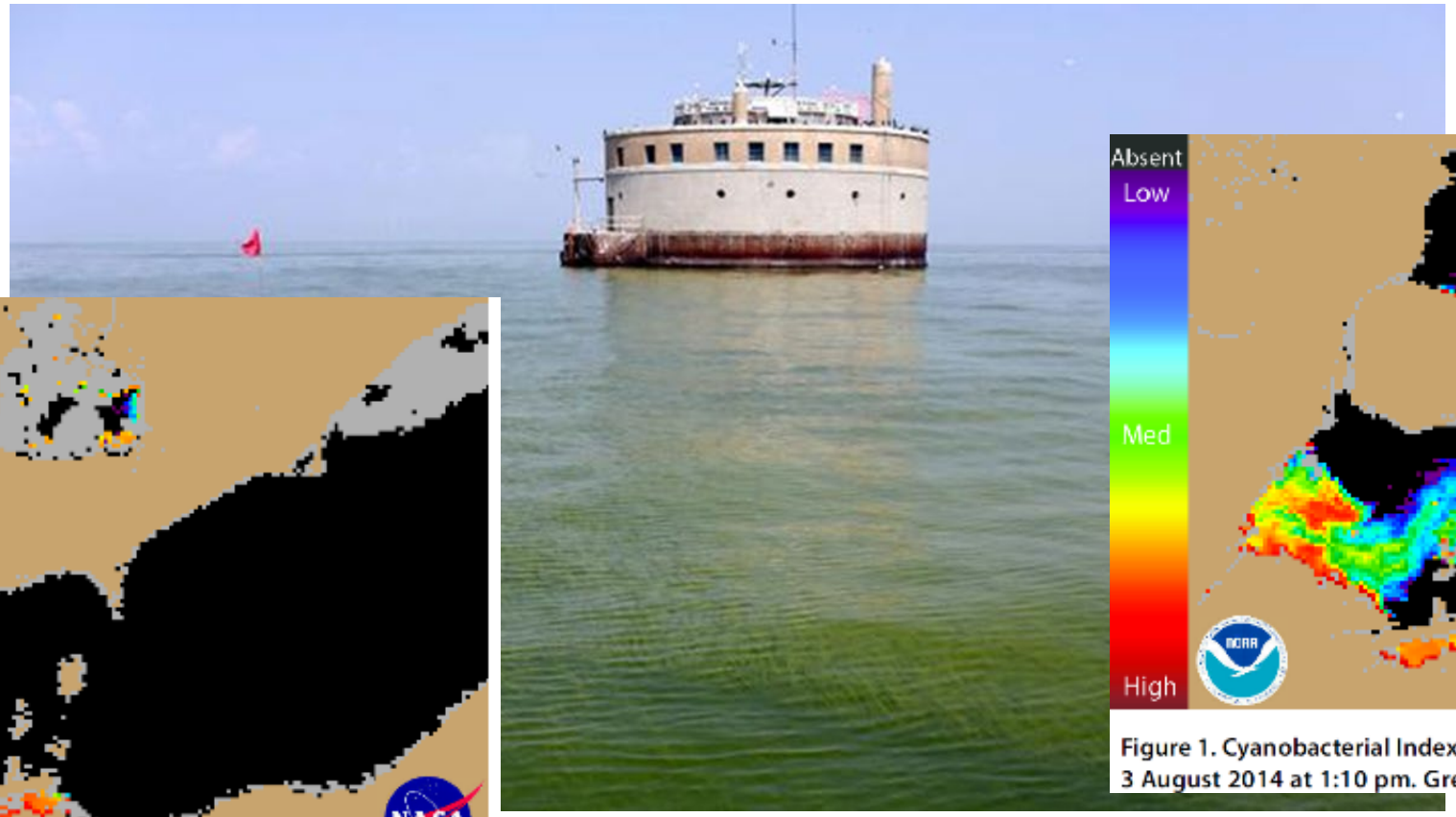


Figure 1. Cyanobacterial Index from NASA's MODIS-Aqua data collected 31 July 2014 at 2:30 pm. Grey indicates clouds or missing data. Black



Bloom August 3, 2014

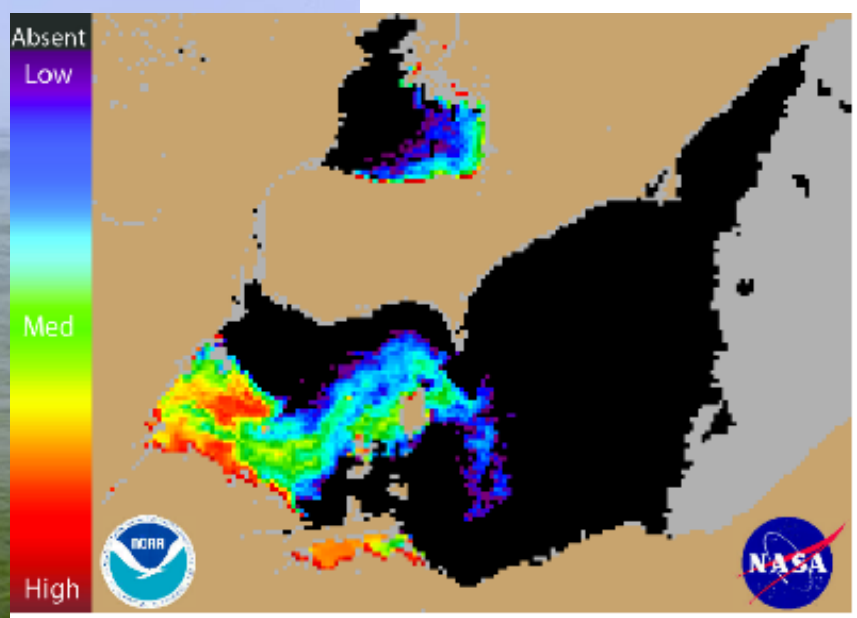


Figure 1. Cyanobacterial Index from NASA's MODIS-Aqua data collected 3 August 2014 at 1:10 pm. Grey indicates clouds or missing data. Black

Ohio Environmental Protection Agency

Toxins Quickly Overwhelmed Water Treatment Plant

Microcystis fills a glass of Lake Erie water near the Toledo water intake crib.

THE BLADE

Enlarge | Buy This Photo

- Extracellular toxin – Harder to remove
- Lack of early detection of changing water quality conditions to inform treatment adjustments
- Maximized all chemical feed capabilities
- In 2014, Toledo treatment plant in need of significant upgrades

Ohio Environmental Protection Agency

Day One – Confirmed Detections

August 1, 2014

- 6:30 p.m. – Ohio EPA was notified that testing results for microcystin were above the threshold
- 11:00 p.m. – Additional samples confirm presence of microcystin above drinking water advisory threshold

Ohio Environmental Protection Agency

Day Two – Issued “Do Not Drink” Advisory

August 2, 2014

- 12:00 a.m. - Ohio EPA recommends a “Do Not Drink” advisory
- 2:00 a.m. - City of Toledo issues advisory for all users
- 5:00 a.m. - Sample results confirmed
- 5:00 a.m. - Ohio Emergency Operations Center activated
- 10:00 a.m. - Governor declares State of Emergency

Ohio Environmental Protection Agency

Day Two – State Response

Drinking Water Plant and Distribution Assessment

- Coordinated analyses of samples
  - Water treatment & distribution
- Worked with researchers and experts on sample collection and handling procedures
- State Highway Patrol aircraft flew eight missions covering 2,266 miles to deliver samples

Ohio Environmental Protection Agency

Day Two - State Response

Alternative Sources of Water for Community

August 2, 2014

- Bulk water deliveries started (over 200,000 gallons of water made available)
- Coordinated water & food delivery
- National Guard, ODOT, ODNR, Corrections, and Ohio Fire Chiefs all supported local water delivery efforts
- Retailers shipped hundreds of semi-trailers of water, infant formula, and prepared meals
- National Guard deployed three reverse osmosis units

Ohio Environmental Protection Agency

Emergency Response Coordination

- Ohio Emergency Operation Center
- Lucas County Emergency Operation Center
- Staff Onsite at Public Water System
- U.S. EPA Cincinnati Office of Research and Development
- Media – Joint Information Center

Ohio Environmental Protection Agency

Impacts of “Do Not Drink” Advisory

- Home Use - Drinking and Cooking
- Restaurants & Food Processors
- Hospitals & Other Care Facilities
- Businesses
- Schools and Universities
- Zoo

Ohio Environmental Protection Agency

National/International Media Coverage

Toxic Algae Bloom Leaves 500,000 Without Drinking Water in Ohio

Codi Yeager-Kozacek, Circle of Blue | August 3, 2014 2:15 pm | Comments

BREAKING: Toledoans asked not to drink or boil water

Posted: Aug 02, 2014 2:06 AM EDT
Updated: Aug 02, 2014 2:29 AM EDT
Posted by WTOL Staff - email

TOLEDO, OH (Toledo News Now) - The city of Toledo has sent out a urgent notice to residents of Toledo and Lucas County who receive water from the city of Toledo.

You are being asked to avoid drinking or boiling water.

Chemists testing water at Toledo's Collins Park Water Treatment Plant had two sample readings for microcystin.

You should not drink the water until an "all clear" is issued.

Here's additional information from the city:

What should you do?

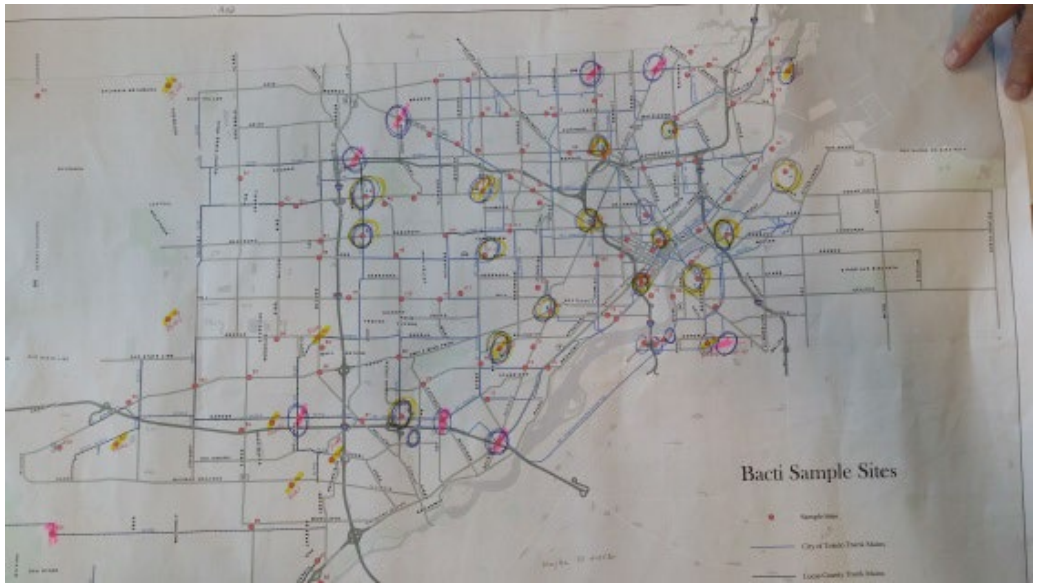
DO NOT DRINK THE WATER. Alternative water should be used for drinking, making infant formula, making ice, brushing teeth and preparing food. Pets should not drink the water.

Ohio Environmental Protection Agency

Day Three – Response Continued

August 3, 2014

- 4:00 p.m. – Ohio EPA, City of Toledo, U.S. EPA and other water quality experts reach consensus on sample collection, handling, and testing protocols
- Additional samples collected and analyzed using consensus method by Ohio EPA, U.S. EPA and City of Toledo.
  - 29 of 30 distribution results below threshold
  - Additional localized samples collected



Ohio Environmental Protection Agency

Day Four – Advisory Lifted

August 4, 2014

- 9:00 a.m. – Ohio EPA and City discuss additional results
  - All within acceptable levels
- 9:35 am – Ohio EPA recommends, and Mayor announces, decision to lift advisory

Ohio Environmental Protection Agency

Post Event Actions – Toledo

- Emergency and Communication Planning
- Fast Tracked Short Term HAB Improvements
  - Monitoring Sondes at Intake and Low Service Pumping Station
  - Potassium Permanganate Feed at Intake
  - PAC Feed Upgrades at LSPS & Collins Park
- Design, bid, and construction of HAB facilities in 7 months
- Created a public facing water quality dashboard
- $500M in WTP upgrades and expansion
  - 160 MGD ozone treatment online Summer 2021

Ohio Environmental Protection Agency

City of Toledo Stakeholder Advisory Committee

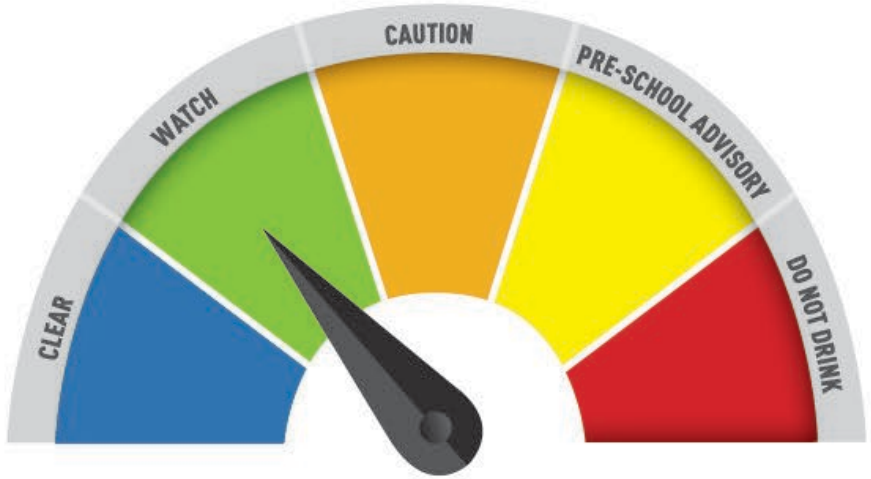
- City convened a stakeholder group to guide effective communication between the City and regional stakeholders
- Committee recommended a dashboard for communicating program progress
- Advised on ways to help restore public confidence in their drinking water
- Prepared key messages that inform the public of:
  - Improvements that will return the water system to a state of good repair
  - Immediate and future actions that provide multiple barriers shielding tap water from contaminants and future HAB events

Ohio Environmental Protection Agency

Toledo Created Water Quality Dashboard

Water Quality

Toledo tests raw and treated water regularly for the presence of toxins, including microcystin created by algae blooms. See scale below for the current status of drinking water quality according to Ohio EPA guidelines.



- **CLEAR** – Less than 5 ppb in the intake crib and Non-Detect in tap
- **WATCH** – Greater than or equal to 5 ppb in the intake crib and Non-Detect in tap
- **CAUTION** – Microcystin has been detected in tap water, but test results do not indicate the need to issue an advisory. Additional testing and sampling is underway and water treatment has been accelerated.
- **PRE-SCHOOL ADVISORY** – DO NOT DRINK for children five and younger. Tap water tests greater than 0.3 ppb and not exceeding 1.6 ppb.
- **DO NOT DRINK** – DO NOT DRINK. Tap water tests greater than 1.6 ppb.

Ohio Environmental Protection Agency

City of Toledo
Blue Ribbon Panel Convened

- Nine panel members with national standing
- Members came from academia, technical, government, and regulatory sectors
- Panel convened in 2015
- Performed a technical review of the draft “General Plan” using best practices in water treatment
- Recommended the addition of ozone for long term treatment of algae

Ohio Environmental Protection Agency

State of Ohio Activities

FUNDING:

- $1 Million Cyanotoxin Testing & HAB Monitoring Grants ($20,000/PWS)
- $50 Million 0% Interest PWS Infrastructure Loans
- $100 Million 0% Interest WWTP Nutrient Reduction Loans
- $3 Million HAB Applied Research Grants

Additional funds made available through Great Lakes Restoration Initiative and other funding sources.

Ohio Environmental Protection Agency

Lessons Learned: Emergency Response Planning

- Communications Plans
  - Protocol for issuing advisory
  - Prepare for media inquiries and keeping public informed
- Around the Clock Staffing Needs
  - A lot of roles to fill & backup staff to provide relief
- Alternative & Emergency Water Supplies

Ohio Environmental Protection Agency

Lessons Learned: Contingency Plan Recommendations

- Identification of critical users/susceptible populations
- Distribution modeling and sampling plan
- Operational measures to isolate contamination within distribution and limit area of advisory
- Procedures for flushing lines
- Pre-authorization for expenditures to implement the contingency plan

Ohio Environmental Protection Agency

Communication Plan: What changed?

- Updated both PWS and Recreational HAB Response Guidance several times since the 2014 event
- Developed multi agency Coordination/Communication Guidance
- Developed public notification templates for PWS (included in PWS Response Guidance)
- Developed signage for recreational HAB response to ensure consistent statewide messaging

Ohio Environmental Protection Agency

Questions?

Shannon Nabors, shannon.nabors@epa.ohio.gov

Amy Klei, amy.klei@epa.ohio.gov

Ohio Environmental Protection Agency

Great Lakes Harmful Algal Bloom (HAB) Communication & Preparedness Workshop

Start Time = 1 PM ET (12 PM CT)

Great Lakes HAB Workshop

Nancy E. Kinner, Facilitator
Coastal Response Research Center (CRRC)
University of New Hampshire

January 17 – 18, 2023

GOAL OF WORKSHOP

- Ensure effective coordination and communication across local, state, and federal governments, and other relevant entities
  - Compile and review existing plans, policies and procedures about effectively communicating HAB threats, including benthic and nuisance blooms, across relevant agencies;
  - Determine the points of contact responsible for HAB event preparedness and response.
  - Create a process(es) for sharing information among relevant entities that ultimately reaches stakeholders and the public in a unified message.
- Understand lessons learned from case studies and their relevance to emerging HAB locations; and apply them to current and emerging threats.

AGENDA

January 18, 2023 (Day 2)

1:00 Opening, Overview, and Logistics

1:05 Overview of Risk + Crisis Communication

- *Katie Krushinski, NOAA*

1:35 HAB Research, Development, Demonstration & Technology Transfer Report, 2008

- *Marybeth Bauer-Martinez, National Centers for Coastal Ocean Science*

1:55 Everyday People and HABs Info

- *David Fitch, GL Observing System*

2:10 Existing HABs Plans, Policies, and Procedures

- *Aabir Banerji, US EPA*
- *Michael Eslick, Muskegon County*

2:50 BREAK

3:00 Communication Breakout Groups

4:00 Communication Report Out

4:40 Wrap Up

- *Felix Martinez, NOAA*
- *Chris Winslow, Ohio Sea Grant*
- *Rachel Pryor, NOAA*

5:00 *ADJOURN DAY 2*

STEERING COMMITTEE

- **Nancy Kinner,** *Coastal Response Research Center*
- **Charlie Henry,** *NOAA*
- **Ruth Briland,** *Ohio EPA*
- **Jennifer Day,** NOAA
- **Regan Errera,** *NOAA*
- **Tony Marshak,** *NOAA* *(until Dec. 2022)*
- **Felix Martinez,** *NOAA*
- **Rachel Pryor,** *NOAA*
- **Chris Winslow,** *Ohio Sea Grant*

HOW TO PARTICIPATE

- Please keep your microphone muted upon entering the Zoom webinar
- Please turn off your video unless you are speaking
- We invite your active participation by submitting questions or comments via the Chat
- If you have any access issues, please contact Kathy at kathy.mandsager@unh.edu or cell 603.498.8010

Questions?/ Comments?

http://crrc.unh.edu/

Risk & Crisis Communication

Great Lakes HAB Communication & Preparedness Workshop

January 18, 2023

About Me

Katie Krushinski

Emergency Management Specialist

NOAA OR&R, Disaster Preparedness Program (DPP)

Contact Info

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Experience

- **Springfield-Greene County OEM** – *Continuity of Operations Coordinator*
- **NOAA Disaster Response Center (Genwest Systems)** – *Exercise & Communication Coordinator*
- **NOAA –** *Emergency Management Specialist*

Education

Bachelor of Science, Professional Writing

Missouri State University

Master of Science, Emergency Management

Jacksonville State University

Professional Certifications

- ***Certified Emergency Manager (CEM)*** – *IAEM*
- ***Master Exercise Practitioner (MEP)*** – *FEMA*
- ***Professional Continuity Practitioner (PCP)*** – *FEMA*

Risk Defined

A threat of loss, real or perceived, to that which we value.

(Covello & Milligan, 2012)

Risk = Hazard x Consequence

What is a Disaster?

- Deadly, destructive, and disruptive events that occur when a hazard (or multiple hazards) interact(s) with human vulnerability. (McEntire, 2007)
- An event that produces greater losses than a community can handle, including casualties, property damage, and significant environmental damage. (Lindell, Prater, & Perry, 2007)
- Sudden-onset occasions that seriously disrupt social routines, cause adoption of unplanned actions to adjust to the disruption, are designated in social space and time, and that endanger valued social objects. (Perry & Lindell, 2007)

What is a Crisis

- A specific, unexpected, and non-routine event or series of events that create high levels of uncertainty and threaten or are perceived to threaten an organization's (or person's) high priority goals. (Sellnow & Ulmer, 2009)

Levels of Crisis

Characteristics	Emergencies	Disasters	Catastrophes
Impacts	Impacts localized	Impacts widespread, severe	Extremely large physical & social impacts
Geographic Extent	Mainly local	Multi-jurisdictional, intergovernmental, bottom up approach	Requires federal initiative, proactive mobilization
Pre-incident Planning	Standard operating procedures used	Disaster plans put into effect – but challenges remain	Massive challenges exceed those envisioned in pre-existing plans
Response Resources	Vast majority of response resources are unaffected	Extensive damage to, disruption of, key emergency services	Emergency response system paralyzed at local and event state levels
Public Involvement	Not generally involved in response	Extensively involved in response	Extensively involved in response, with long-term mass convergence
Recovery	No significant recover challenges	Major recovery challenges	Cascading long-term effects, with massive recovery challenges

(Tierney, 2009)

Communication

Risk Communications

A science-based approach for communicating effectively in a:

- High concern environment
- Low trust
- Sensitive topic
- Controversial situation

Goals of Risk Communication

Increase Knowledge & Understanding

- Clear, concise, and science-based info
- Know your audience and target your message

Enhance Trust

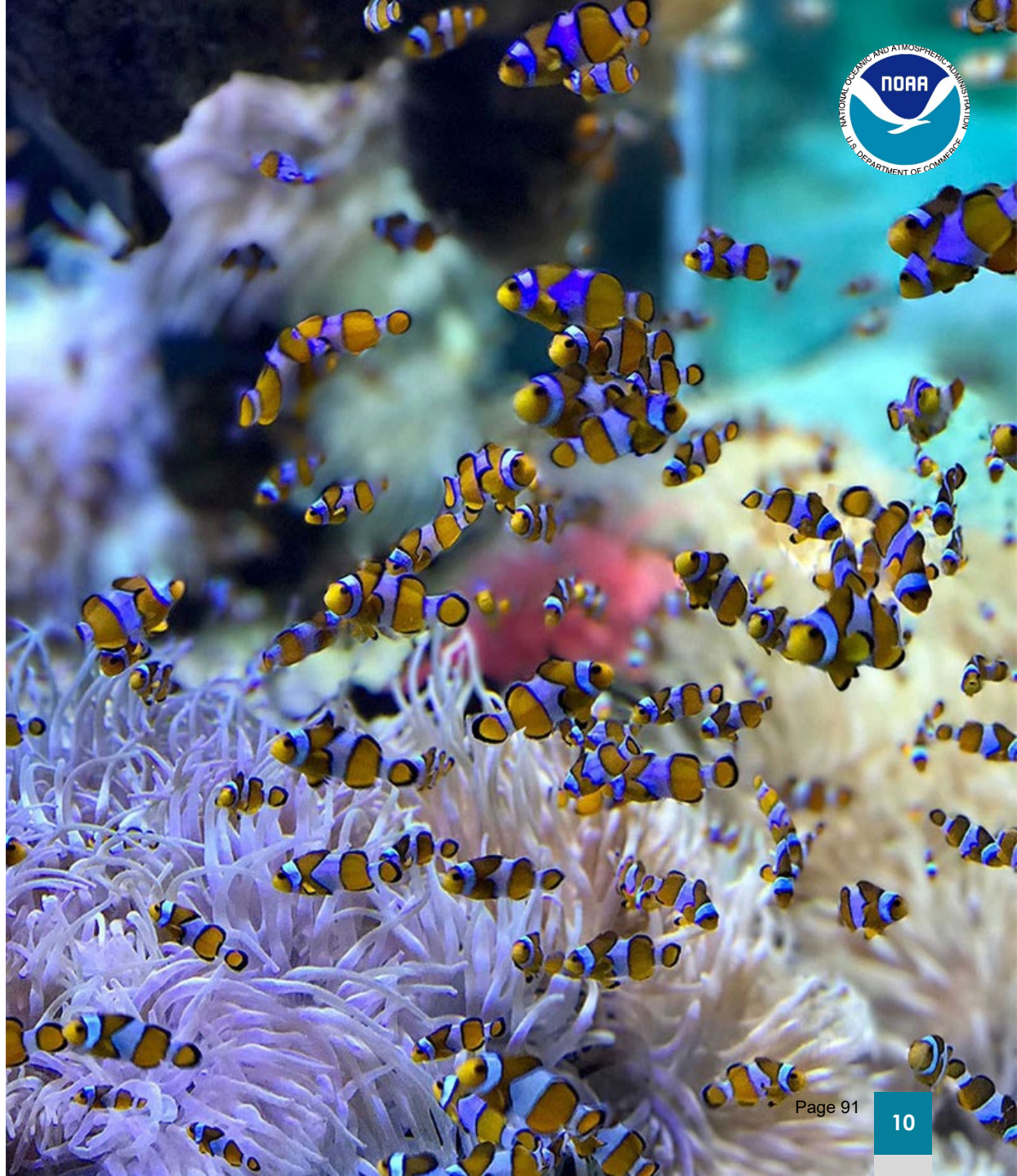
- Ensures your audience "hears" your message(s)
- Help to improve people's actions and heed warnings

Resolve Conflict

- Acknowledge and resolve quickly
- Helps to promote knowledge and understanding while building trust

Crisis Communications

The exchange of risk-relevant and safety information during an emergency situation. (Sellnow, Ulmer, Seeger, & Littlefield, 2009)



Risk vs Crisis Communications

Risk Communications

- Exchange of information about the nature of the risk and risk management options
- Essential to manage potential risks
- Effective communication:
  - Take into account audience's existing beliefs, including perceptions about risk
  - Address audience's decision/judgements (opinions)

What MIGHT happen

Crisis Communications

- More message driven
- Use media to influence public beliefs, opinions, and judgments
  - Regain control of the situation and conversation
  - Minimize impact on operations and target audiences
  - Minimize time spent on crisis
- Rapid response communications from external/public affairs

What HAS happened

Perception

Past Experiences

Many people compare disasters and their impacts to create their perception of the current situation.

"The last winter storm was just a dusting—I don't need to stock up on anything!"

Socioeconomic Factors

Factors such as employment, education, and income influence people's perception.

If people don't have the resources to repair and/or rebuild, their perception of the risk changes.

Availability of Information

Getting the right message to the right people at the right time is key to determining one's level of risk.

Be aware of your community's populations.

Build Trust: Empathy & Honesty

Do

- Acknowledge uncertainty
- Establish your own humanity
- Acknowledge errors, deficiencies, misbehaviors
- Apologize early & often
- Be careful of comparisons

Don't

- Over-reassure
- Aim for zero fear
- Lie or tell half truths
- Ridicule the public's emotions

Build Trust: Dedication & Expertise

Do

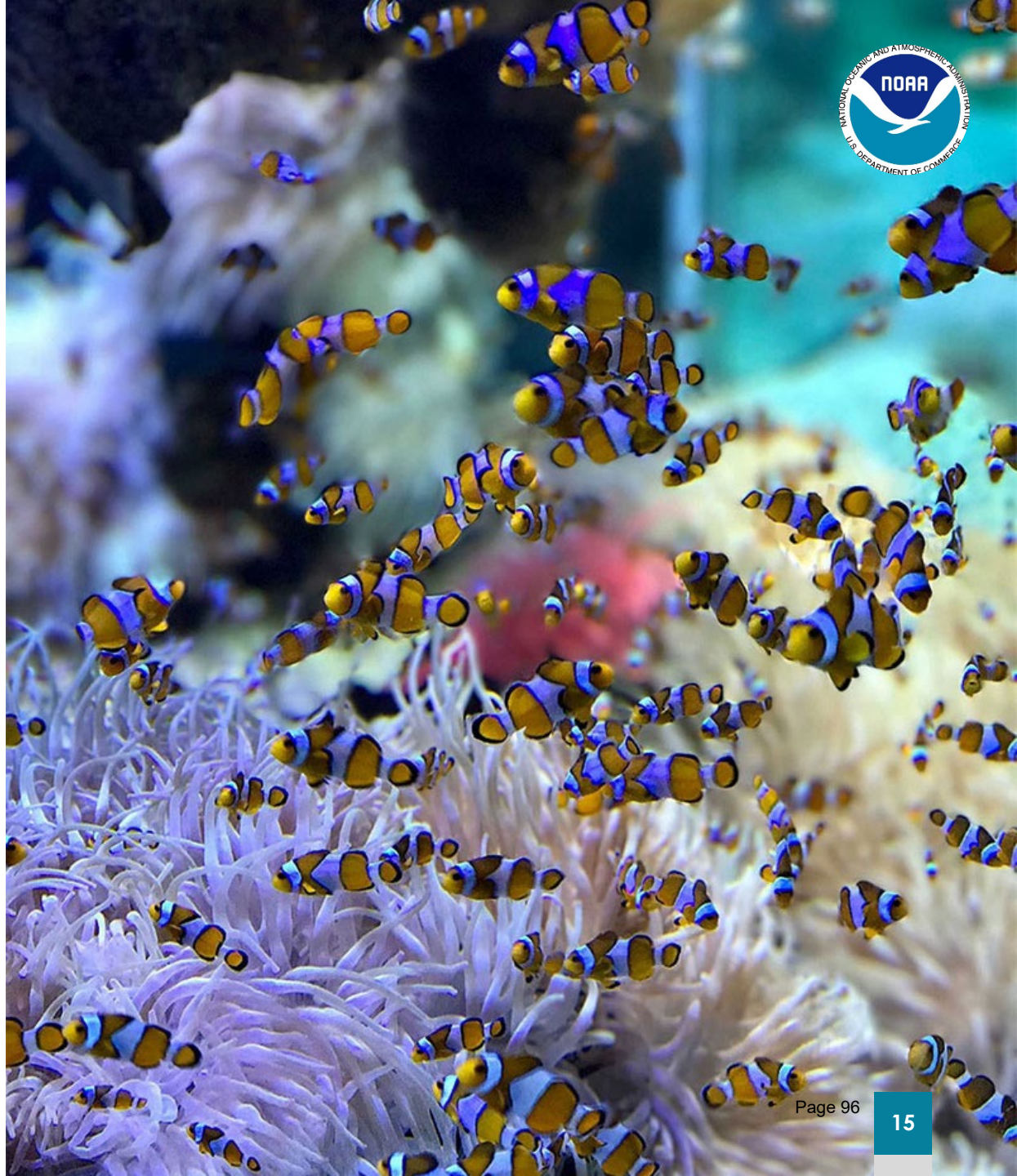
- Prepare at least 3 times more facts/figures
- Be organized
- Dress appropriately
- Be concise, clear, & brief
- Develop key messages specific to your stakeholders
- Use active listening

Don't

- Use technical jargon
- Use lots of notes
- Avoid written speeches
- Ignore audience's non-verbal queues

Communicating Through Social Media

- Understand the level of effort and time commitment
- Strategically choose social media platforms
- Share your message on multiple platforms
- Be sure to share science-based information
- Leverage your audience's networks



Non-Verbal Communication

- Provides 2/3 of your messages content
- Noticed immediately by audience
- Interpreted negatively
- Over-rides verbal communication

Final Thoughts

- *Know your audience*
- *Make a plan*
- *Communicate early and often*

> There's not a lot of news when the company takes responsibility and moves on. The good crisis management examples rarely end waving the flag of victory. They end with a whisper, and it's over in a day or two.
>
> *- James Donnelly, Ketchum's Senior Vice President for Crisis Management*

QUESTIONS?

References

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- Tierney, K. (2009). Disaster response: research findings and their implications for resilience measures. *Community & Regional Resilience Institute*. http://www.resilientus.org/library/Final_Tierney2_dpsbjs_1238179110.pdf.

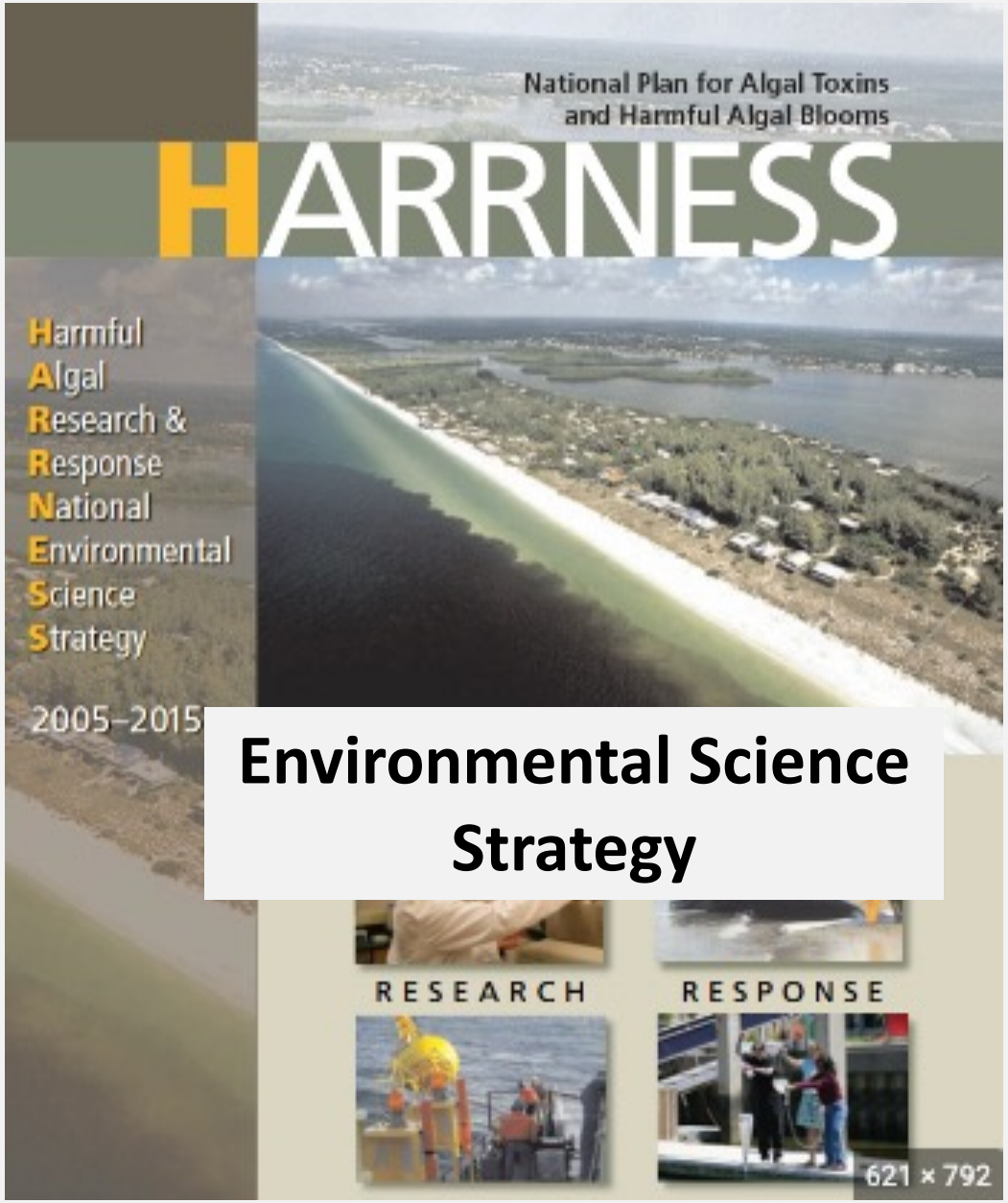
Risk Communication:

A Social Science Resource and Research Project

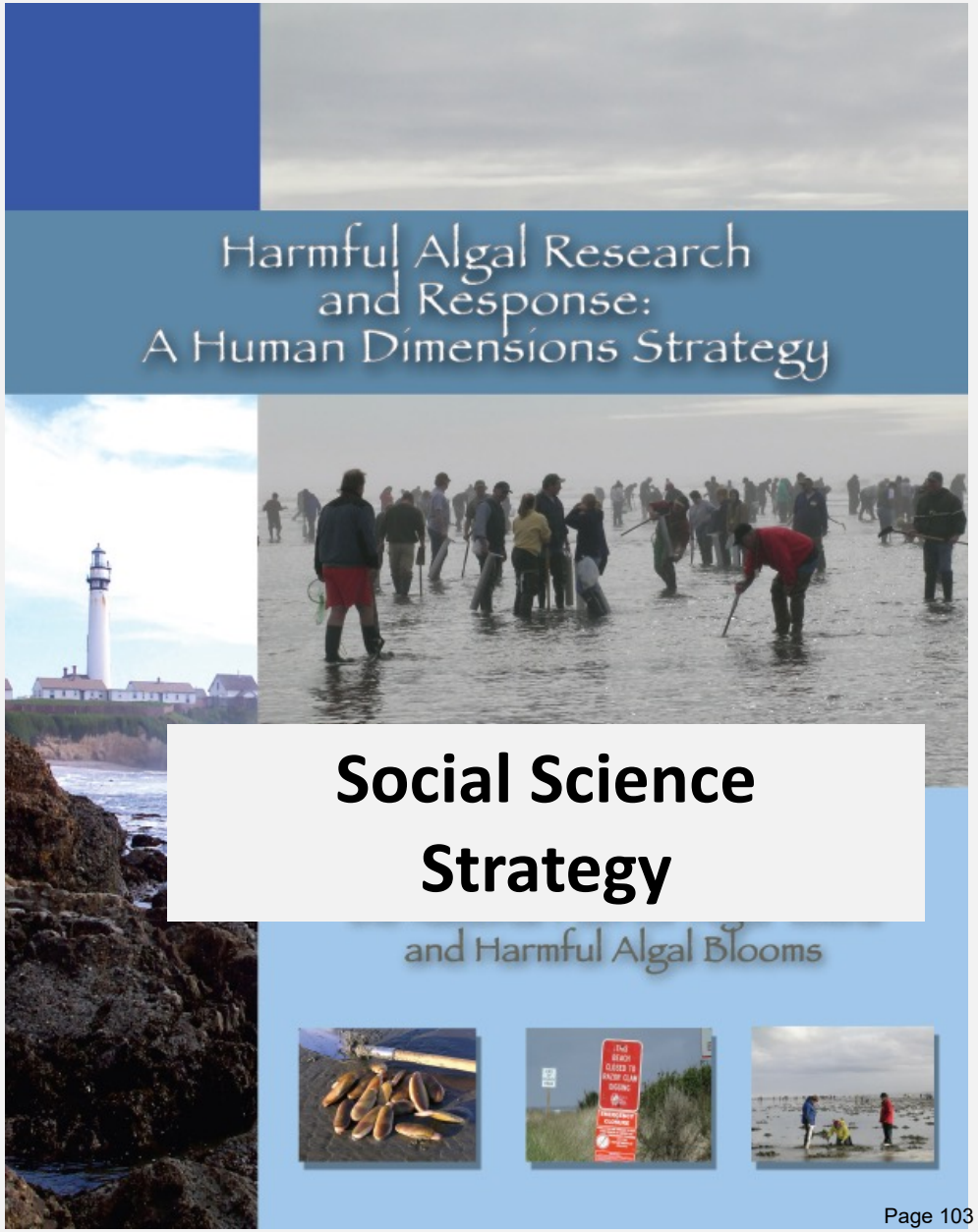
Marybeth Bauer-Martinez, PhD

Great Lakes HAB Communication & Preparedness Workshop
January 18, 2023

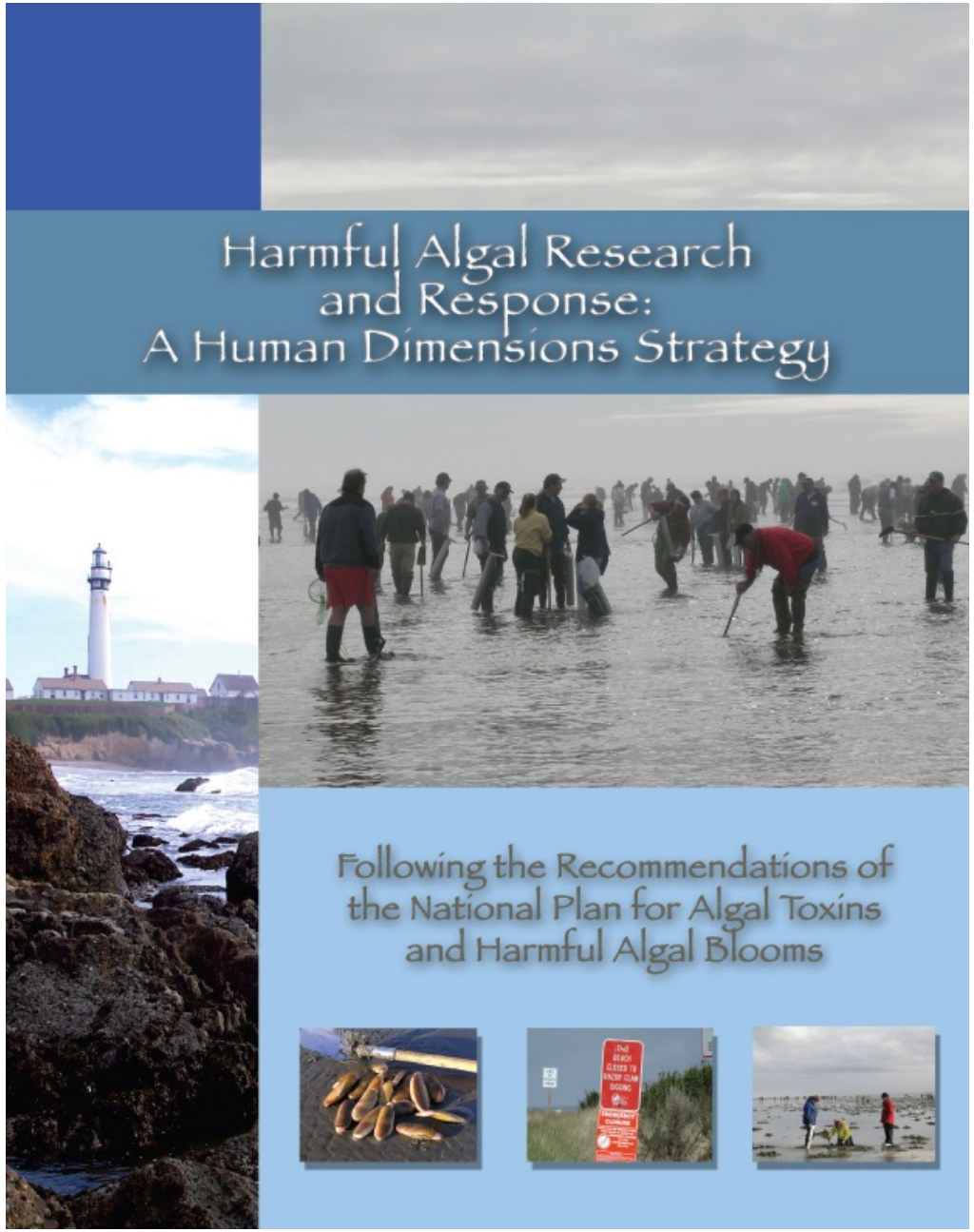
Credit: NASA/USGS satellite.



Environmental Science Strategy



Social Science Strategy



Interdisciplinary Social Science Interagency Scope

SYSTEMS FOR REPORTING ILLNESS

SOCIOCULTURAL IMPACTS

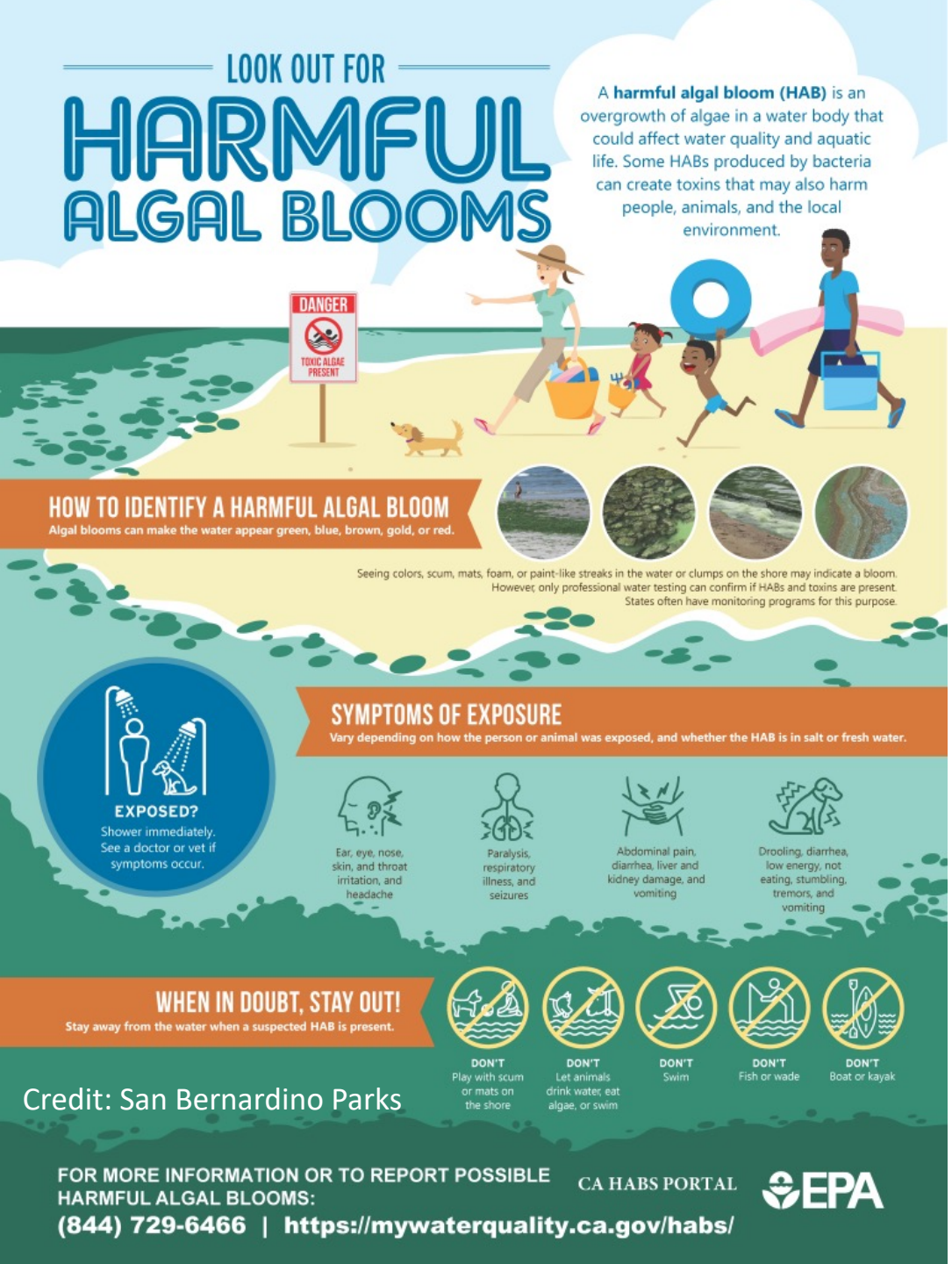
ECONOMIC BENEFITS OF FORECASTS

RISK COMMUNICATION

And more!

Credit: The State Journal-Register

Risk communication studies can inform our risk communication practice



Credit: San Bernardino Parks

Guiding Questions when Communicating Risk

Who are your priority audiences?

How can I learn about their experiences, perceptions, values, concerns? Audiences have different:

- Perceptions of science and risk
  - Range from not a real problem to extreme fear
- Concerns about fairness and equity in management
- Barriers to receiving information based on past experiences
- Trusted sources of information
- Preferred communication channels ....

What are your communication goals?

- Build trust – Priority to achieve all other goals
- Provide appropriate information
- Change behavior – avoid exposure, reduce cases
- Foster stakeholder participation in decision-making

How will I get to know my audiences?
What messages and strategies will work?

Credit: Commercial Fishing in the FL Keys

Credit: The Truth Behind Commercial Fishing

Designing Risk Communication Messages and Strategies: Commercial Fishermen in West Central Florida

Sherry Larkin, Chuck Adams, John Stevely, Chris Pettit, Linda Lampl, Cliff Scherer, Mario Sengco, Marybeth Bauer, Pat Tester – Part of a larger "mixed methods" project

Focus Groups: What did we learn from commercial fishermen?

- Ecological model – HABs are natural, humans shouldn't intervene
- Lack of trust – scientists just trying to generate work for themselves
- Marginalized from decision-making – we have knowledge too

Communication Goals

- Provide "appropriate" information, recognizing the ethos of "natural"
- Develop trust
- Foster participation in decision-making, local knowledge

Next Steps:

- Design and implement communication messages and strategies
- Florida FWCC lost funding :(

Florida Fish and Wildlife Conservation Commission

Take home

Interagency Social Science Report

May be a resource for understanding how social science can help mitigate impacts, including through risk communication.

Risk Communication Studies

Can inform your design and implementation of messages and strategies.

Focus Groups

One way to gain a nuanced, in-depth understanding of your audience to craft effective communication messages and strategies.

Social Science Research Strategy: https://repository.library.noaa.gov/view/noaa/9286

Sharing Experiences

What are your experiences with using focus groups or other methods to understand your audience?

How have you used information from focus groups or other methods to design your communication messages and strategies?

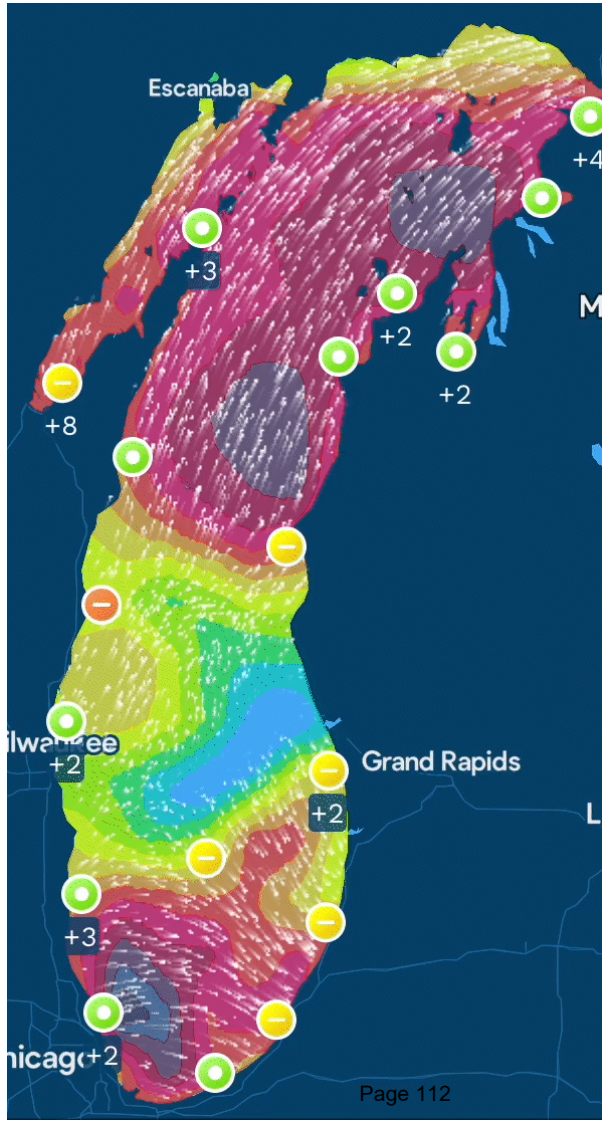
Everyday people and HABs info

David Fitch | Communications Specialist
Great Lakes Observing System | david@glos.org

Photo by NASA Earth Observatory

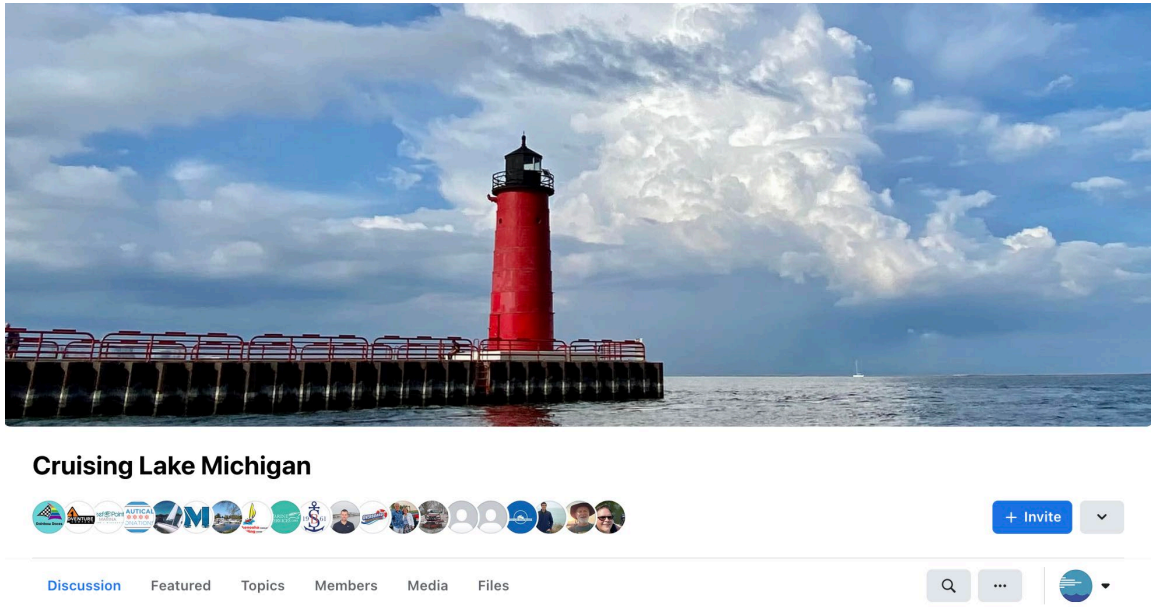
How do we deliver lake information?

- Seagull Platform is 1 year old: seagull.glos.org
- Two surveys that helped shape development
  - Rec User Survey
  - HAB Stakeholder Assessment



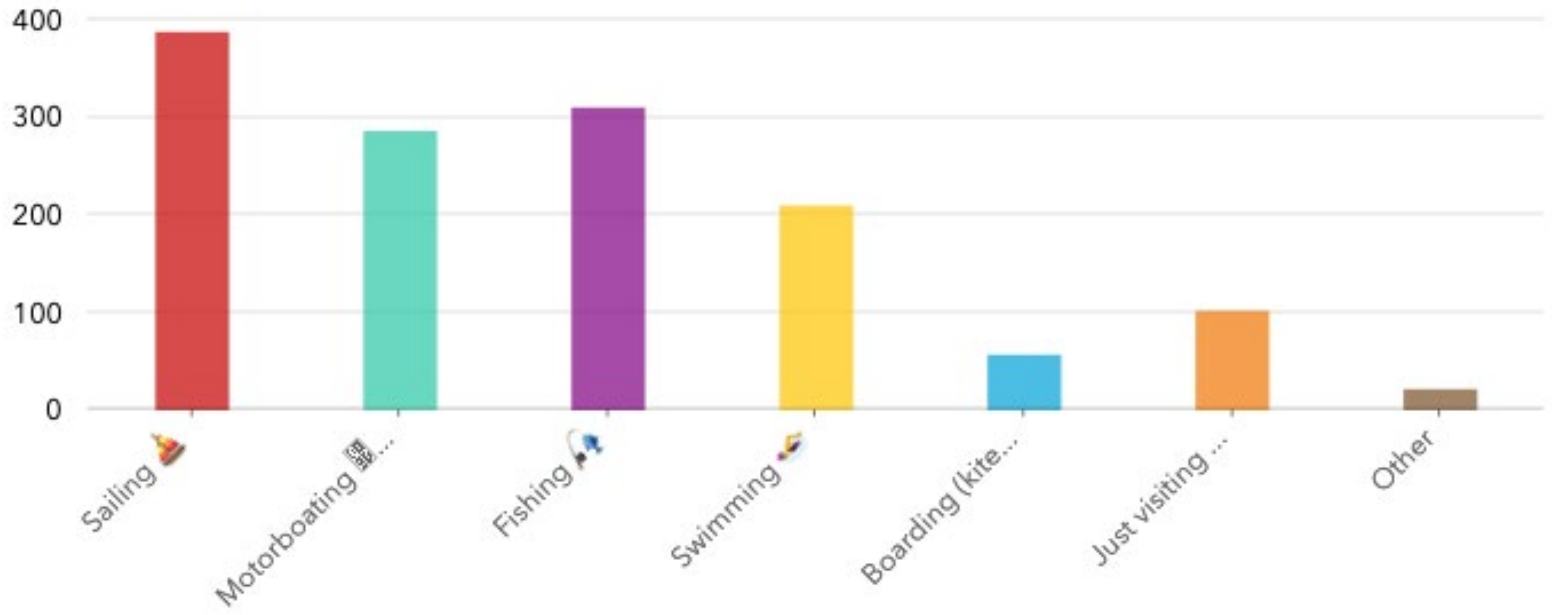
Rec Users Survey

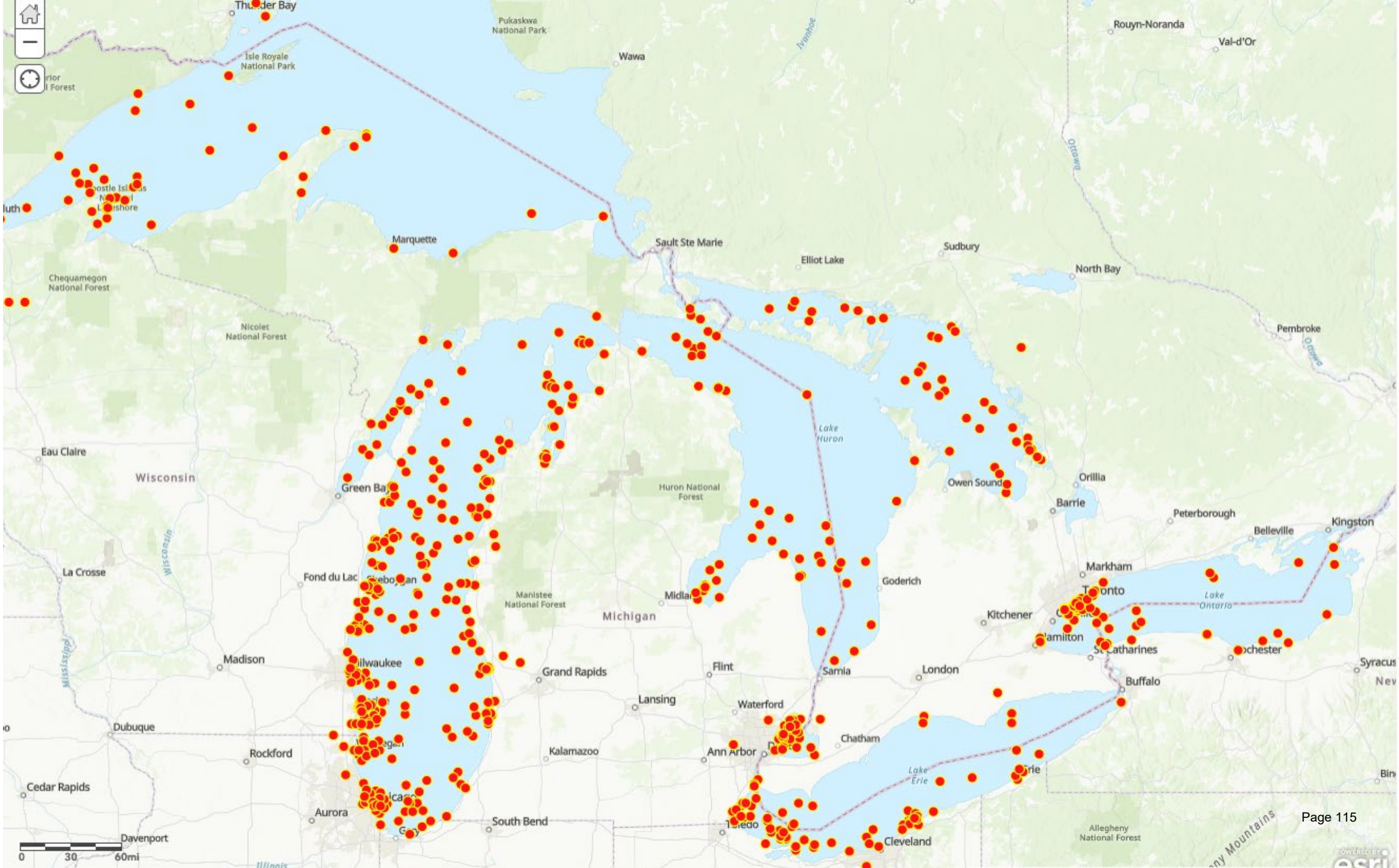
- In 2021 wanted to understand recreational community
  - Not a scientific study *(We're not social scientists)*
  - Approached rec boater groups (Yacht Clubs, Facebook groups, Marinas)
  - Questions:
    - How do they get lake information?
    - What would they like to see changed?



Who we reached

- 780 respondents
- Nearly half sail
- Over 50% were most interested in Lake Michigan




Thunder Bay
Pukaskwa National Park
Wawa
Isle Royale National Park
Rouyn-Noranda
Val-d'Or
Marquette
Sault Ste Marie
Elliot Lake
Sudbury
North Bay
Chequamegon National Forest
Nicolet National Forest
Pembroke
Lake Huron
Eau Claire
Wisconsin
Green Bay
Huron National Forest
Owen Sound
Orillia
Barrie
Peterborough
Belleville
Kingston
La Crosse
Fond du Lac
Manistee National Forest
Michigan
Goderich
Markham
Toronto
Lake Ontario
Kitchener
Hamilton
St Catharines
Rochester
Madison
Milwaukee
Grand Rapids
Flint
Samia
London
Buffalo
Lansing
Waterford
Dubuque
Rockford
Kalamazoo
Ann Arbor
Chatham
Lake Erie
Cedar Rapids
Aurora
South Bend
Toledo
Cleveland
Allegheny National Forest
Davenport
0
30
60mi

What they said

- 86% use apps or services to monitor lake conditions
  - 55% National Weather Service Website
  - 35% National Data Buoy Center Website
  - 27% GL Buoys Website
  - 25% NOAA Great Lakes Environmental Research Lab Website
- They use many other services, too…

NOAA - Great Lakes Environmental Research Laboratory

Home | Quick Links | About Us | Research | Data & Products | Publications

Great Lakes Coastal Forecasting System, GLCFS

NOTICE: Please visit our new GLCFS site at www.glerl.noaa.gov/res/glcfs-fvcom/glcfs.html. This new site will display our next-gen FVCOM model output res grids for all parameters, except for waves which will continue to use the gle donelan wave model on lower-res POM grids. On May 10, this current site will b removed or will be redirected to the new site.

Research to Operations Notice

GLCFS NOWCAST: 04/08/2021 (DOY 098) 1800 GMT - *Experimental*

Nowcasts updated by about 0030, 0630, 1230, and 1830 GMT (subtract 4 for EDT, 5 for EST)

NEW GLCFS PQT Request Form (replaces the GLOS Point Query Tool)

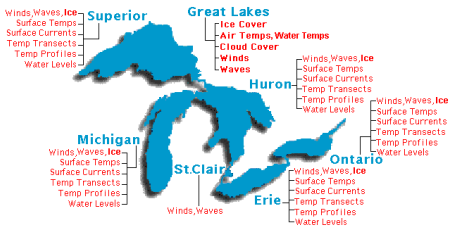
Comparison of this year vs last two years water temps and ice

Comparison of nowcast forcing parameters

Comparison of 72-hr forecast winds: NDFD vs NAM vs GFS

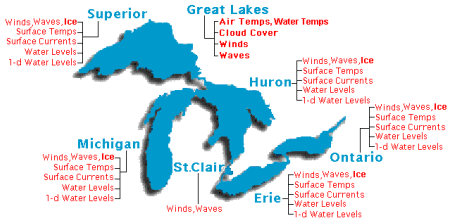
Comparison of temperature profiles

Heat Flux Estimates, Heat Content Estimates



GLCFS FORECAST: 04/08/2021 (DOY 098) 1200 GMT - *Experimental*

Forecasts updated by about 0130 and 1330 GMT (subtract 4 for EDT, 5 for EST)



Other Wave Forecasts: WaveWatch III, NWS Great Lakes, NWS NDFD

Links:

- GLCFS Factshe
- GLCFS-FVCOM
- NOS Great Lak Forecast Syster
- National Weath
- NWS White Lak
- CoastWatch GL
- GLERL-Donelat
- NOAAPORT W and Marine Obs
- GLOS Data Por

Related Site:

- Grand Haven N
- HECWFS

Additional Resource

- Winds, Waves, Temps, Ice, GL GoogleMaps
- Combined anim and waves (lak
- Surface Current
- Simulated River Tracks, Lake Er
- Additional Wate Wind/Wave Dat
- Status, Status2
- Settings
- What's New
- Gridded Fields
- NetCDF Depot
- NetCDF Archive
- KML Depot
- WWW stats
- POMGL stats: e
- Ice stats: e h m
- Wave Model No
- What is GMT?
- What is KML?
- NDFD Status
- Guan ncast, Gu
- NWS Transfer F

Realtime Data Disclaimer

Comments? gregory.lang@noaa.gov

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Dr. Jia Wang	Dr. Dima Beletsky		
NOAA/GLERL	CIGLR		
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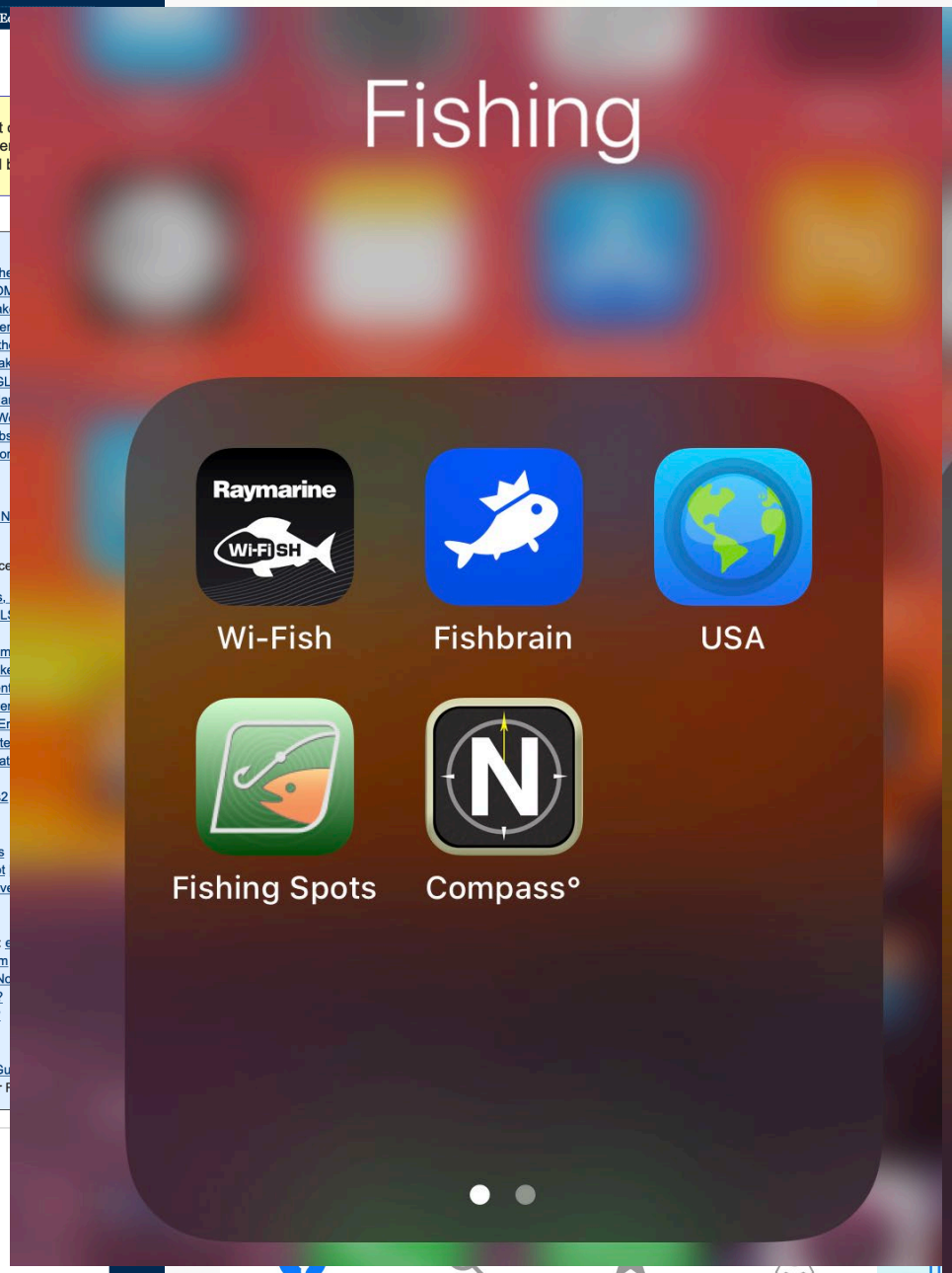


What they said

- Parameters ranked
  1. Wave Height
  2. Wind Speed and Direction
  3. Wind Gust
  4. Wave Period (time between waves)
  5. Water Temperature
  6. Air Temperature
  7. Water Current Speed and Direction
  8. Water Temperature at Multiple Depths
  9. Webcam
  10. Water Chemistry

What are they like?

- Willing to search multiple sites, if necessary
- Savvy and eager to learn
- Know the buoys
- Very aware lake conditions
- Use their phones 

What they want

- “Somewhat satisfied” with what’s on offer
- Want
  - One stop shop, one click
  - Data presented for non-experts
  - More buoys
  - More accuracy
  - Better marketing of services

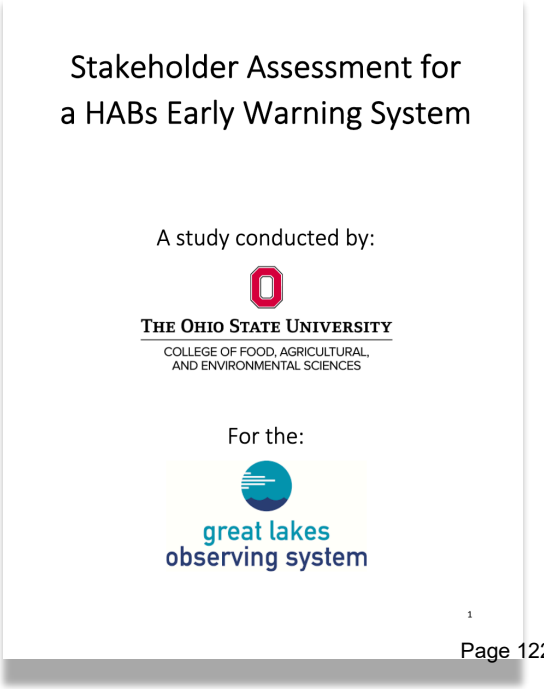
great lakes observing system

One place that doesn't require searching, comparing, or interpretation.

HAB Stakeholders Assessment

- 2018 project to build an early warning system for Lake Erie
  - An IOOS ocean technology transition grant
- 2019-2020 survey
  - Led by Robyn Wilson at The Ohio State University
  - In partnership with Ohio Sea Grant

glos.org/HABs



A mixed-mode survey

- Questions:
  - How people receive HAB information
  - Impact of HABs
  - What info they'd like
- Professionals, residents, and visitors

Professionals

- Including
  - Charter captains
  - Decision makers
  - Lakeside business owners
  - Marina operators
  - Media reps
- Emailed a Qualtrics survey

Residents

- Living within 30 miles of the lakeshore
- Eight counties
- Emailed a Qualtrics survey

Visitors

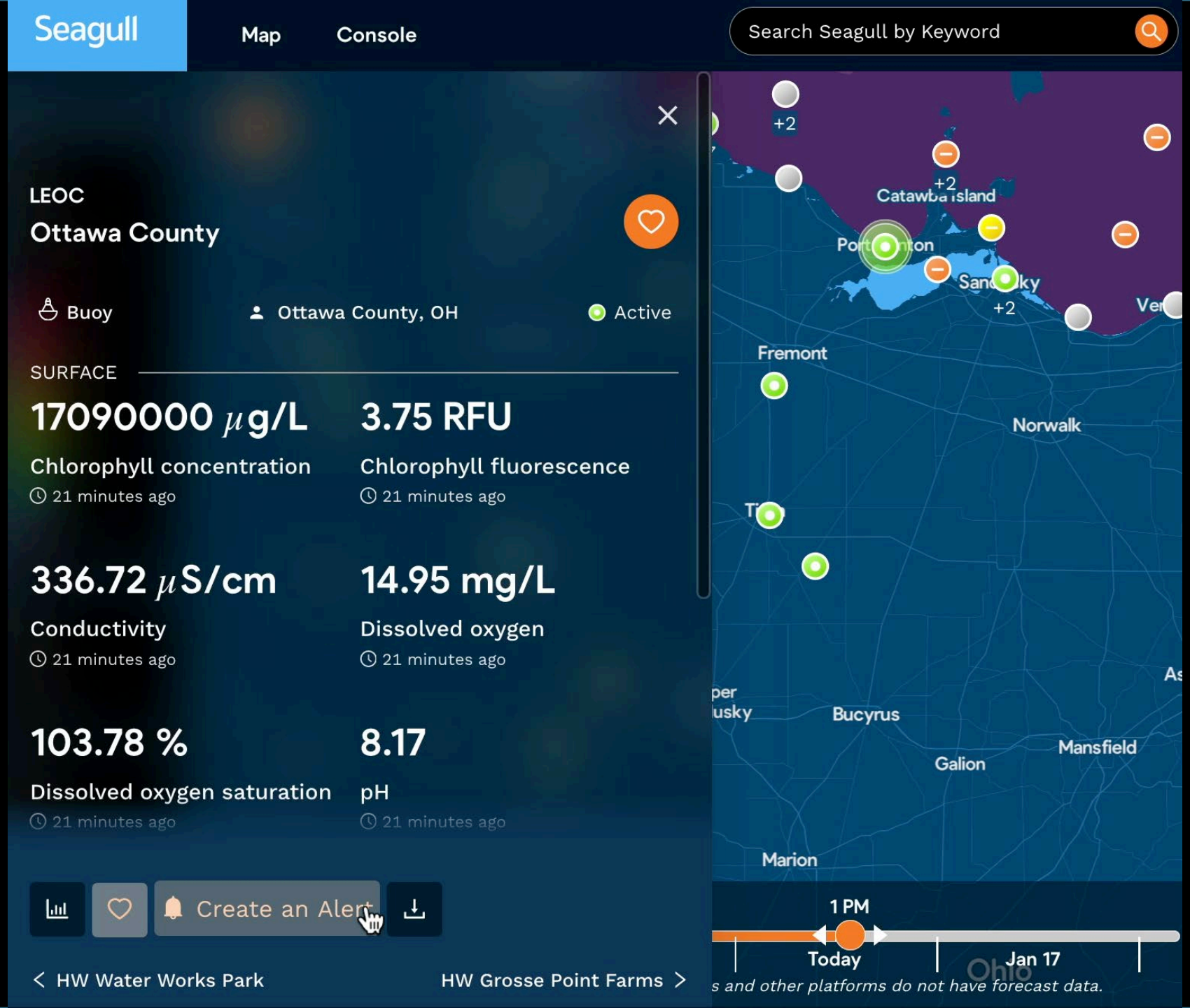
- Research staff surveyed 182 people in-person
- South Bass Island Aquatic Visitors' Centre and Maumee Bay State Park

What do they care about?

- Professionals are by far **the most engaged** with Lake Erie info
- **Drinking water** is the most important
- **Interested in HABs info** because of concerns about the economy, recreation, and knowing how to mitigate the impacts of HABs
-  Residents and  professionals have different needs

How do they want to be reached?

- **Email is best** for 85%
- **Current conditions** and one week forecast
- **Daily updates** as things get bad for health/recreation
- **Most common source** of info: NWS/other NOAA sources
- Info should **come to them**
- **Different services** recommended


Seagull
Map
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LEOC
Ottawa County
Buoy
Ottawa County, OH
Active
SURFACE
17090000 µg/L
Chlorophyll concentration
21 minutes ago
3.75 RFU
Chlorophyll fluorescence
21 minutes ago
336.72 µS/cm
Conductivity
21 minutes ago
14.95 mg/L
Dissolved oxygen
21 minutes ago
103.78 %
Dissolved oxygen saturation
21 minutes ago
8.17
pH
21 minutes ago
Create an Alert
HW Water Works Park
HW Grosse Point Farms
Catawba Island
Fremont
Norwalk
Bucyrus
Galion
Mansfield
Marion
1 PM
Today
Jan 17
s and other platforms do not have forecast data.

Table 2. Percentage of stakeholders who often or very often receive HAB information from sources

	Charter Captain	Decision Maker	Lakeside Business Owner	Marina Owner	Media Rep	Resident	Visitors
	N = 84	N = 210	N = 84	N = 25	N = 85	N = 413	N = 182
GLOS	30.9%	21.4%	18.0%	23.5%	21.1%	11.4%	N/A[1]
National Weather Service	52.1%	44.4%	44.1%	52.9%	42.5%	40.4%	45.4%
NOAA	59.2%	48.9%	30.8%	41.2%	47.9%	9.6%	N/A

⏳ Last thoughts

- To communicate well, we'll have to keep a pulse on people
- Keeping it:
  - Simple
  - Tailored (as much as possible)
  - One-stop
- Asking > guessing

Questions?

david@glos.org

Links mentioned: glos.org | seagull.glos.org | glos.org/HABs

Public Health
Prevent. Promote. Protect.
Muskegon County

Muskegon COUNTY

Public Health Muskegon County

Harmful Algae Bloom Response Procedure

A little history:

- 2019 was the first year where PHMC was called to respond to a HAB event
- No funding available from State or Federal
- Very little training available
- Coordination of events was lacking
- Understanding of “what to do” not clear
- No procedure in place for response

Need for a procedure:

- PHMC has had an E.coli beach monitoring procedure in place for over a decade; however, HAB's was not included in it
- Needed a better understanding of HAB's to create a procedure
- First couple of years was definitely a learning curve
- E.coli beach event proved to be much different than a HAB event
- Established HAB's procedure in 2022
- Next slides will answer some questions on PHMC procedure

How (or if) communication to stakeholders is addressed in your procedure?

- Stakeholder listing created and updated annually
- Stakeholders include:
  - County Administration
  - County Board of Commissioners
  - Township or City Administrators
  - Park Administration
  - News Agencies
- How?
  - Complaint/alert is received by EH
  - Health Department Administration is alerted
  - Designated staff sends email with a specific letter (tailored for event)
  - Public Notice issued through PHMC Emergency Coordinator
  - EH staff field calls per notice

How many times has procedure been activated?

- 2022 Busy Season
  - 3 sustained HAB's events
    - Muskegon Lake
    - White Lake
    - Spring Lake

White Lake near local Marina - 2022

How many times does it get reviewed?

- Procedures are to be reviewed and revised annually
- 2022 came with some changes
- PHMC – EH staff trained to take initial HAB samples
- PHMC and EGLE sending in samples to BOL (Bureau of Labs)
- Sustained postings were more standard

- 2022 Questions (Lessons learned) to be reviewed:
  - How often should an ongoing event be sampled?
  - When should a posting or alert be modified?
  - What if the event remained until sampling stopped for the season?
  - When should a Public Notice be issued? Lifted?
  - How do we know the Public has appropriate knowledge of the event?
  - Are we doing enough? Too little or too much?

QUESTIONS?


DANGER: Harmful Algal Blooms
A harmful algal bloom has been found in this water:
DO NOT touch water or shoreline with algal blooms.
DO NOT swim or recreate near algal blooms.
DO NOT let pets swim in or drink water near algal blooms.
DO NOT boat, jet ski, or fish in algal blooms.
IF you went in the water DO rinse people and pets off.
Harmful algal blooms look like: spilled paint, pea soup, floating scums, mats, sheens, clumps, or streaks
When in doubt, keep yourself, children, and pets out!
Call your doctor or veterinarian if you or your pet/animal get sick after going in the water. For more information, visit Michigan.gov/HABs
Public Health
Prevent. Promote. Protect.
Muskegon County
231-724-6208


Algae Awareness
Have fun in the water, but always look for harmful algal blooms that can make people and pets sick.
DO NOT touch water or shoreline with algal blooms.
DO NOT swim or recreate near algal blooms.
DO enjoy clear water or shoreline with no algal blooms.
Always rinse people off after any water contact.
Always rinse pets off after any water contact.
Harmful algal blooms look like: spilled paint, pea soup, floating scums, mats, sheens, clumps, or streaks
When in doubt, keep yourself, children, and pets out!
Call your doctor or veterinarian if you or your pet/animal get sick after going in the water. For more information, visit Michigan.gov/HABs
Public Health
Prevent. Promote. Protect.
Muskegon County
Call
231-724-6208

Appendix C: Breakout Group Notes

Great Lakes HABS - breakout group on case study 1 on day 1

Questions	Answers						Answers			
2. How do you communicate across the different levels government during a HABs event?	Usually coordination is within another coms department, social media manager. Background often comes with direct communication with scientists.	Most of what is being delt with is not to the point of crisis communication. Reporting occurances occurs through forms to DHS, follow up by the department. State agencies and local public agencies are involved to collect data and report back to local public health organizations. Actions can be taken from there including issuing advisories, further communication, etc.	In the local level, emergency operations included back and forth communication between centers and agencies	If information is coming in through user reports, review information first to determine what sampling may need to occur. Share information across agencies to review detections, reports. Clear communication (response and share information) within sister agencies. Have relied on EPA for data analysis and collaboratoin with US EPA for evaluating treatment capabilities and responses. Efforts on EPA to report drinking water status.	Reach out for sampling from different agencies, then focus on areas of interest. Outreach to local Sea Grants, EPA, etc. to find connections with local stakeholders in the region.	Data share email that reports every week spanning state and federal agencies. Includes what data is being collected and where. Used to track bloom size throughout the year and not only when detected. Currently looking to update data share for better communication method. Website is publically linked to access to data share information.	We have with our larger inland lakes. 3 major extended blooms. Different than e. coli. There are many questions that are different: Do you close the whole lake for one beach? We had an event in 2021 and 2022 that started in August and we stopped testing in late November. What do you do with these extended closures? How do you relay it to the public?	We would get calls in 2011 about HABs but at the time we did not have the framework. There has been a change in emphasis in the last 4-5 years. The last report we got was in November. There is an increased awareness and response across the state.	The responsibility in Michigan is within Eagle and then we are able to reach out to others in the area to confirm what needs to be done. It is not formalized as a response plan for public view, but there is a response structure. The local health departments have the responsibility to issue the warnings/advisories. We provide information, resources, and recommendations. We do not have a state-wide code for when an advisory takes place.	
How do you communicate to the stakeholders / end users?	For communications for drownings, education to public through pamphlets, news letters, etc.	Department of Health has developed fact sheets for dogs, public access. Work together with outreach events which bring together scientists and homeowners/stakeholders.	Software Base Camp provides information to stakeholders and quick introduction of information to outside consultant, team member, etc. Allows for sharing files, limited in editing across users	Ohio Department of Health Screen for Green.	ITRC is used across US to provide information on HABs and resources for identification, resources.	Events such as Science Writers Meeting with topics focusing on HABs. Courses are also offered as workshops for HABs identification, and reaches people on the front line. These occur throughout the year, not only during a HABs event.	Interagency HAB working group in Michigan. State and local partners, also USDA Forest Service. It does not respond to particular situations, but works through concerns that come up. Developing materials and coordination. We have contacts with Michigan Sea Grant and have good coordination there. Disconnect occurs more on the research part of HABs. It tends to not make it to the response agencies.	HABs occurs mostly in the inland lakes. We need to know who is surrounding the lakes. Making sure we provide good resources available, answer questions, and provide local information. We also share information from EPA, CDC, and Eagle.		
3. How could communication be improved? Ex. Is your level of content adequately tailored to your audience? Ex. Are the methods you use to reach your audience effective?	Translation into the language of region could be improved to reach diverse audience. The translation may require a new method of relying information.	Using trusted routes of communication within the community/local level	Refining the terms used in communication with public members. Rebranding the public view where it can be	Limiting the use of acronyms to make information understandable for public. Balancing the relying of information and assumptions to make sure information can be retained. Images, word choice, graphics are all important for appropriate communication	Using external resources (news reporting language) to communicate and rely information with clarity.		Sea Grant has been involved in research about the best way to communicate and connect with people about HABs. A graduate student is working on this. We have seen in Michigan that dogs have died due to HABs. Using a story-based approached is being looked at. Also how people connect with colors, etc. HABs articles/fact sheets might be another good way to get information out to people.			
4. Based on the presentations today, what is one key thing that you learned and how might this help you moving forward?	Using user surveys and focus groups to target communication both in type and method of delivery.	Internal disscussions about updates for current communication and next steps. Reviewing and training to gain stakeholder awareness to match communication across all levels	There are resources out there other than what may be experienced.				Getting different groups together and coordinating a strategy when a bloom occurs. Knowing that it is the local jurisdiction is responsible for closing the beach, etc. Getting the information out to the public. There are many different groups involved which was helpful. A bloom occured recently and word got out very quickly and the beach was closed.			
5. What changes could be made for next time?							Difficult to communicate how long a HABs event will last. All we can do is recommend. For the local public health interest, it would be recommended to just close the beach right away.	We post caution signs in Michigan as opposed to closing beaches. We like to have the sample results to confirm that it is a concern, but there might be value in posting a caution sign if it looks like a concern. Sometimes a sample is not collected if it is likely that there is a HABs event.		
6. What lessons did you learn from this?										
Other							Time of year seems like an interesting factor. Several people have seen blooms in November. You cannot consider yourself off duty until later in the year. Planning for how to cover the full period of time.	Helpful to have a large group of people and coordinating talking points. Educating the public more on what these events look like might be important. Citizens could be better equiped to know what these look like.	Recognizing HABs needs to be an ongoing, generational thing (like recognizing poison ivy) so everyone can recognize it. I think this is happening in lakes where there are recurring blooms.	Education is key. Inform people of their environment. Understanding that HABs might be located in different areas of a lake but it also might not be impacting the entire lake. The wind moves it around the lake, but there are certain areas that experience more blooms than others. That also factors into education.

Great Lakes HABS - breakout group on case study 2 on day 1				
Questions	**Answers**			
1.Have you faced a similar situation in your area?	Several of our municipalities draw water from lake Superior. We noticed from a vessel that there was an algae bloom that you could not see from the coast. We would collaborate with the health department, state, drinking water facility. I have not been contacted about a plan but there might be one in place. Creating that type of relationship could be important in case this type of event happens.	We have had a couple of scares on lake Michigan but they turned out to not be HABs. Many of our drinking water plants participated in the EPA testing that occurred a few years about about monitoring for toxins. Many have continued to participate in that. There is weekly testing at a number of drinking water sites. Individual response might be dependent on the plant's capabilities. Some drinking water plants do take water from lakes that are a concern for HABs so there is additional testing at those.	Our cities on lake Michigan are on the western edge, so we are less likely to have problems with this yet. Cities on western Lake Erie do experience these problems. The ones on lake Michigan are not as likely to have the experience that Ohio has.	
2. How would this have played out in your area?				
2a.Is the chain of command similar?	Having people named from the agencies that could respond when an event occurs would make everything a lot quicker.			
2b.Would you have contacted / consulted the same people?				
2c.What challenges would you have faced?				
3. What went right and why?	No advisory levels at the time. Going forward, now we know that EPA has advisory levels and information that should be known sooner.			
4.What went wrong and why?				
5. What changes could be made for next time?				
6. What lessons did you learn from this?	Responding quicker. If you need to treat an algae bloom, you need to have certain chemicals on hand. Algal forecasting would be a good idea. Similar to having to be prepared for PFAS treatment. Potential development of more local forecasting systems.			
7. What has been done since Toledo and how Ohio reacted to the situation?	We are on the third or fourth draft of a response guidance for this. Our latest version is from 2020 but we have been updating it. We use NOAA's satellite monitoring data. When it comes to a response, we reach out to local health jurisdictions.	Kicked off a ton of health related research. It caused a lot more people to be interested in HABs and health related impacts.	Increased understanding and models of what is going to happen as the climate changes. More big storm events, warmer lakes. We will have to expect more of these HABs events. Toledo might be a template that organizations can work from.	More HAB events in areas where there used to not be due to climate change. Need to be prepared/talk to partners about that. Sometimes it takes an emergency to open the eyes of people who think it will not happen to them.
8. Other Ideas	Maintaining trust with the public about safe drinking water. This is challenging when you do not have the answers right away. If the agencies do not tell the public right away, then people might lose trust as well. An advisory over 10 days is also tricky to communicate.	Having staff to look at the satellite data is an important investment. That capability does not exist everywhere. Ohio does that regularly, but you need a person assigned to that in other locations. There are satellite data limitations, but it is a tool we could be using more. Hyperspectral cameras from a plane is also a tool used in NOAA but that is only done for western lake Erie.	NOAA deployed people, boats, and sampling. We were out there communicating about it. There seems to be more communication but less on the research side. Ohio worked closely with EPA.	Ohio Sea Grant takes the lead on HABs for western lake Erie for the most part. We do not tend to be involved unless it is specifically a Michigan issue. North Central Water Network has a HABs group and they just did a presentation online. Water infrastructure presentations from people who work in water plants and researchers. People need to intentionally plan out and organize these groups. New research map for researchers to connect.

Great Lakes HABS - breakout group on communication on day 2							
Question	**Answers**						
1. How do you communicate across the different levels government during a HABs event?	Usually coordination is within another coms department, social media manager. Background often comes with direct communication with scientists.	Most of what is being delt with is not to the point of crisis communication. Reporting occurances occurs through forms to DHS, follow up by the department. State agencies and local public agencies are involved to collect data and report back to local public health organizations. Actions can be taken from there including issuing advisories, further communication, etc.	In the local level, emergency operations included back and forth communication between centers and agencies	If information is coming in through user reports, review information first to determine what sampling may need to occur. Share information across agencies to review detections, reports. Clear communication (response and share information) within sister agencies. Have relied on EPA for data analysis and collaboratoin with US EPA for evaluating treatment capabilities and responses.	Reach out for sampling from different agencies, then focus on areas of interest. Outreach to local Sea Grants, EPA, etc. to find connections with local stakeholders in the region.	Data share email that reports every week spanning state and federal agencies. Includes what data is being collected and where. Used to track bloom size throughout the year and not only when detected. Currently looking to update data share for better communication method. Website is publically linked to access to data share information.	Here is the link to USEPA website for management tools for public water systems: https://www.epa.gov/ground-water-and-drinking-water/cyanotoxin-management-tools-public-water-systems. This is the public website for the data share: https://www.glerl.noaa.gov/res/HABs_and_Hypoxia/wle-weekly-current/
2. How do you communicate to the stakeholders / end users?	For communications for drownings, education to public through pamphlets, news letters, etc.	Department of Health has developed fact sheets for dogs, public access. Work together with outreach events which bring together scientists and homeowners/stakeholders.	Software Base Camp provides information to stakeholders and quick introduction of information to outside consultant, team member, etc. Allows for sharing files, limited in editing across users	Ohio Department of Health Screen for Green.	ITRC is used across US to provide information on HABs and resources for identification, resources.	Events such as Science Writers Meeting with topics focusing on HABs. Courses are also offered as workshops for HABs identification, and reaches people on the front line. These occur throughout the year, not only during a HABs event.	
3. How could communication be improved? Ex. Is your level of content adequately tailored to your audience? Ex. Are the methods you use to reach your audience effective?	Translation into the language of region could be improved to reach diverse audience. The translation may require a new method of relying information.	Using trusted routes of communication within the community/local level	Refining the terms used in communication with public members. Rebranding the public view where it can be	Limiting the use of acronyms to make information understandable for public. Balancing the relying of information and assumptions to make sure information can be retained. Images, word choice, graphics are all important for appropriate communication	Using external resources (news reporting language) to communicate and rely information with clarity.		
4. Based on the presentations today, what is one key thing that you learned and how might this help you moving forward?	Using user surveys and focus groups to target communication both in type and method of delivery.	Internal disscussions about updates for current communication and next steps. Reviewing and training to gain stakeholder awareness to match communication across all levels	There are resources out there other than what may be experienced.				

Answers					
The department of health and human services is involved in the wording in Michigan. There is an email that people can use to report HABs and we are involved in sharing other resources related to HABs (fact sheet, etc.). Getting people connected to state and regulatory groups if they need sampling.	EPA resources (link in chat). The communication comes from a state or local level typically for a specific event. We meet with region 5 states 3 times a year. It would be nice to meet in person more.	Website, one-pagers, techinical bulletin. Forecasting products: another bulletin for that. Email list. Outreach and communication to sell our product. Outreach efforts could improve. It is more reactive than proactive.	Communications working group that brings in Sea Grant, NWS. Need to have a one-stop site with talking points and visuals. When a HAB event occurs, it would be easier to not have to replicate that work. Trying to create a better relationship between NOAA and the states but it can be challenging to know who to reach out to.	Typically do less communication during a HAB event than when a HAB event is not occuring. The communication is typically how to avoid it. During a HAB event I will field questions about background information. Less of those questions now that HAB events are becoming more common.	
Stakeholders: the public. Tend to give research presentations. Will also present to watershed counsils, environmental groups, etc. Provide an overview of HABs and research. Less media interactions partly due to USGS media restrictions where we can only mention our specific research. End users: management community, decision makers. HABs collaboratory. We have a facilitator role help us put together what the scientists know and what the people need to know. Information that is the most useful to the most people in that target audience. The main audience of the collaborative has been the decision makers. Within the collaborative it is a consensus building approach. It bridges the communication. Not a lot of media contacts, more people who want to be up to speed on the topics. Human health fact sheets recently have pulled in the states as well because it is important to get that information correct and to have the language precise.	On our DNR website if you type in algae, the first result is the blue-green algae page. People can report a bloom and there are resources. We also have a beaches webpage with all opening and closings that are updated in real-time. The public will reach out to a variety of sources and we end up redirecting questions and answers. News announcements go through our office of communications.	In the Great Lakes, networking that information is beneficial without having to recreate the wheel. Networking across the region between groups that all use the same type of graphics. In this region that might be useful because we are so collaborative. So many organizations doing pieces of the bigger picture.	Visual representations can be very helpful. There could be a flow chart that is about what to do if there is a HAB or if you seen green water, etc. Example of a pie chart graphic: https://oaklandinvasivespecies.org/common-contacts/ That type of thing can be useful alongside figuring out how to organize it. Also useful internally.	Another example of a graphic: https://www.glc.org/wp-content/uploads/Who-does-what-HABs-Factsheet-FINAL.pdf We found we could not make just one fact sheet for the Great Lakes because it is very state dependent. We did try but this is what we came up with in the end. Many challenges in a document saying who to talk to. It can also vary at the county level. Communication challenge for end users when they are trying to figure out who to communicate with.	We do not put a specific person on our documents for who to talk to. We have a general HAB email that people can send questions to. If each organization had a HAB email, that may be helpful to put on all documents.
Maybe it is better for people to just contact whoever they know and then that person can direct them to the correct person to contact. Many products are not for a specific audience, they are for the general public. That is an area that could be improved. It is tricky because you do not always know where a HAB event will take place. Difficult to know where to start.					
Communication can be improved between states and also within my own organization. Focus groups to develop projects can be helpful.	Thinking more about who the audience is. Where are areas where I have seen gaps? How to reach those audiences?	Updates to Seagull Mapper. Interesting tool. Did not know HABs were in there. So many apps people use for lake conditions.	Importance of making sure your audience trusts you and that the information being put out there is considered important to more than just scientists.	Audiences will pick up on weird things and having it destroy their trust. Communicating in a crisis situation/on tv is daunting.	

Appendix C: Complied Breakout Group Notes

Day 1: Case Study 1

1. Have you faced a similar situation in your area?
2. How would this have played out in your area?
    a. Is the chain of command similar?
    b. Would you have contacted / consulted the same people?
    c. What challenges would you have faced?
3. What went right and why?
4. What went wrong and why?
5. What changes could be made for next time?
6. What lessons did you learn from this?

Day 1: Case Study 2

1. Have you faced a similar situation in your area?
2. How would this have played out in your area?
    a. Is the chain of command similar?
    b. Would you have contacted / consulted the same people?
    c. What challenges would you have faced?
3. What went right and why?
4. What went wrong and why?
5. What changes could be made for next time?
6. What lessons did you learn from this?

Day 2: Communication Discussion

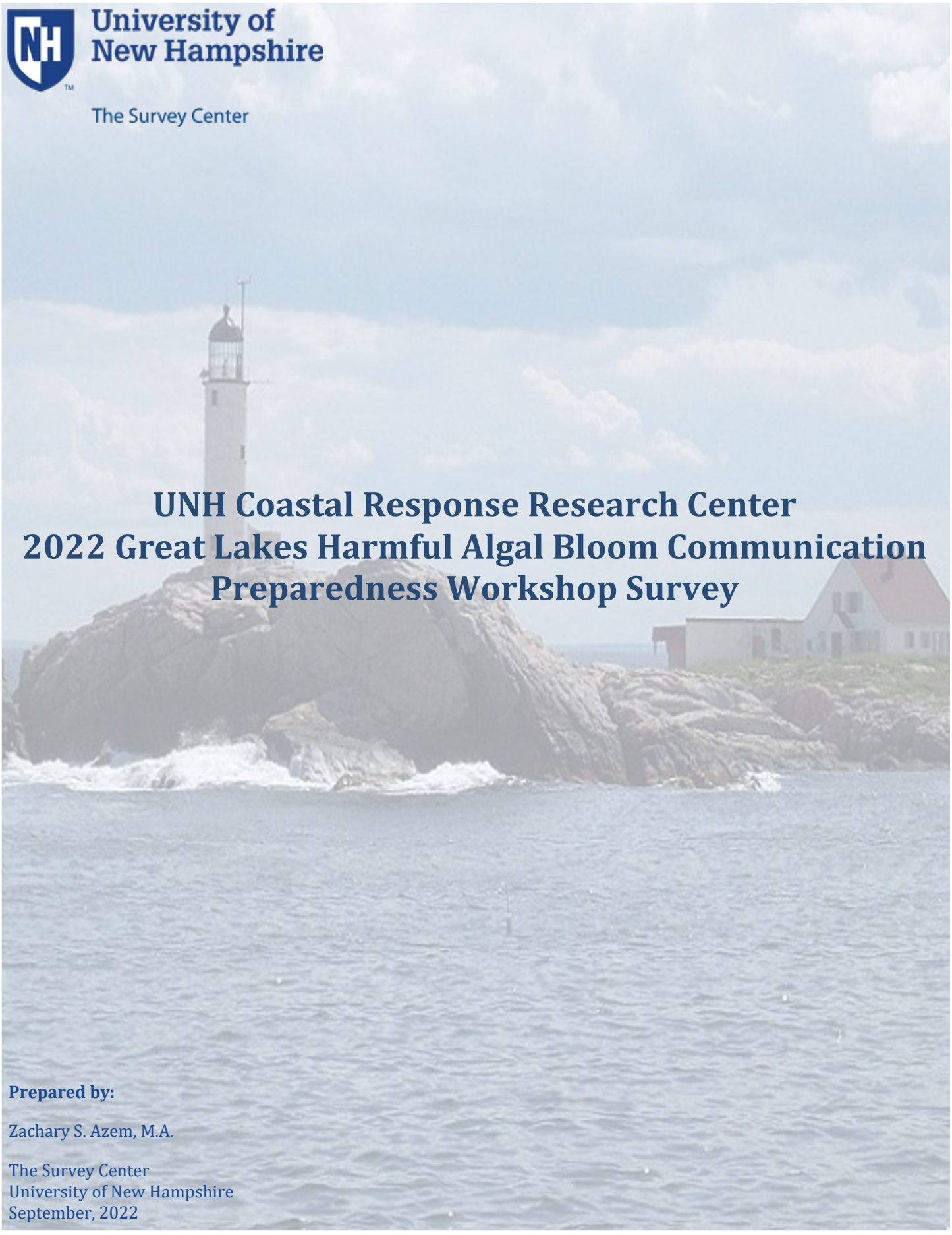
1. How do you communicate across the different levels of government during a HABs event?
2. How do you communicate to the stakeholders / end users?
3. How could communication be improved?
4. Based on the presentations today, what is one key thing that you learned and how might this help you moving forward?

Appendix D: Survey Report

https://crrc.unh.edu/resource/GL_HABS

University of New Hampshire

The Survey Center



UNH Coastal Response Research Center
2022 Great Lakes Harmful Algal Bloom Communication Preparedness Workshop Survey

Prepared by:

Zachary S. Azem, M.A.

The Survey Center
University of New Hampshire
September, 2022

The University of New Hampshire
Survey Center

The UNH Survey Center is an independent, non-partisan academic survey research organization and division of the UNH College of Liberal Arts.

The Survey Center conducts telephone, mail, web, and intercept surveys, as well as focus groups and other qualitative research for university researchers, government agencies, public non-profit organizations, private businesses and media clients.

Our senior staff have over 50 years experience in designing and conducting custom research on a broad range of political, social, health care, and other public policy issues.

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Table of Contents

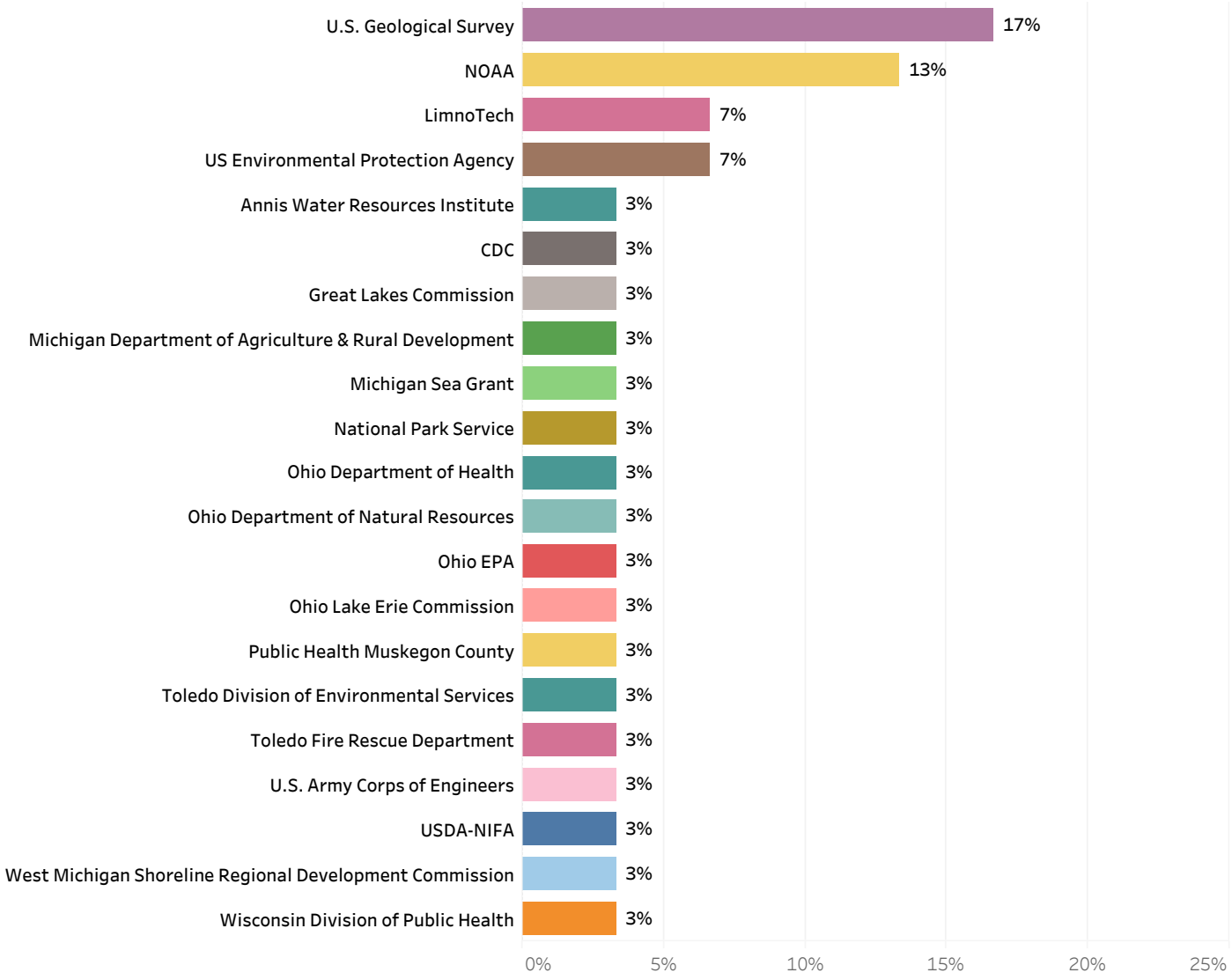
Executive Summary

The University of New Hampshire Survey Center conducted a survey for the University of New Hampshire Coastal Response Research Center in order to better understand current Harmful Algal Bloom (HAB) responses plans, policies, procedures, and communication in order to inform the development of content for a virtual workshop that will be held by NOAA and the CRRC later this year. Survey emails were sent to one hundred and fifty-seven (157) relevant stakeholders on September 6th, with email reminders sent to non-responders on September 15th and 21st. The survey was closed on September 26th. Thirty-two (32) respondents completed the survey, resulting in a response rate of 20%. The following figures display survey results and Appendix A contains the survey instrument. Due to rounding, percentages may not sum to 100%.

Organizational Details

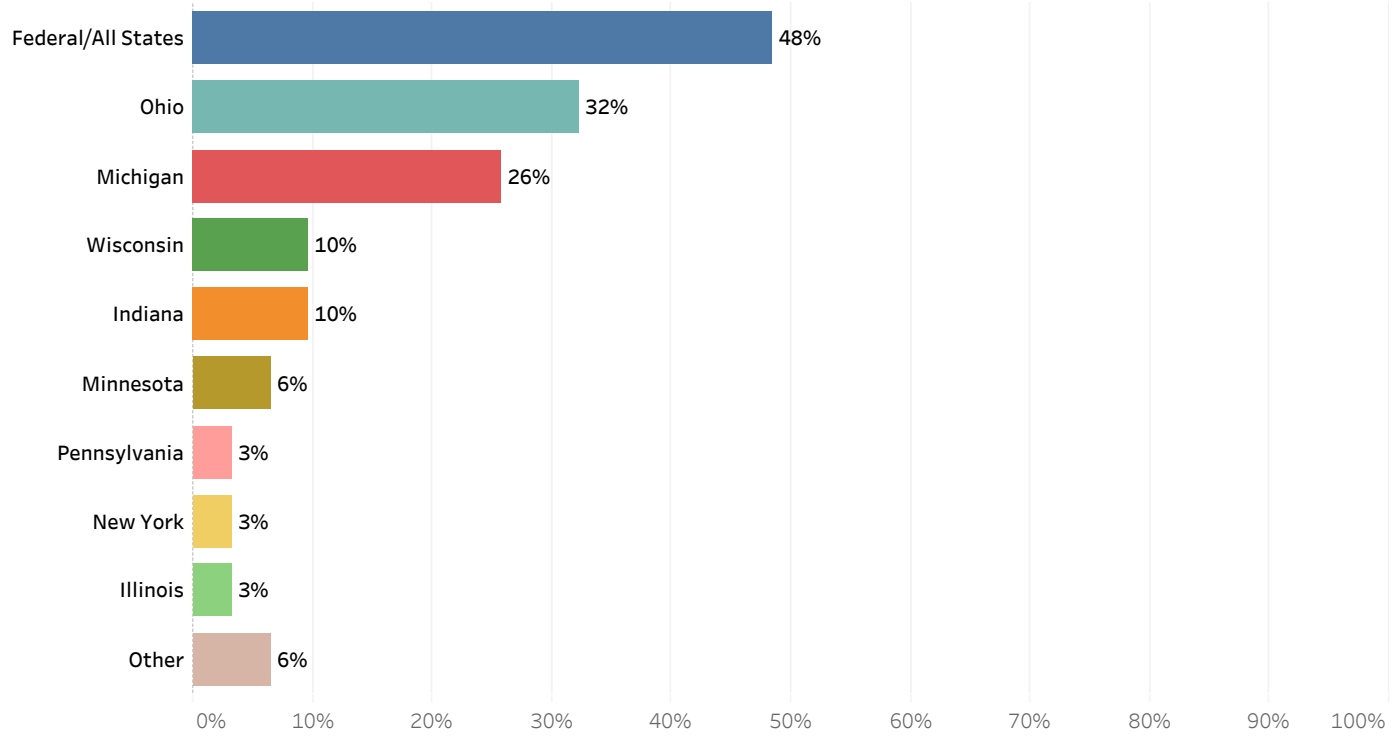
Seventeen percent of respondents say their agency or organization is the U.S. Geological Survey while 13% say their agency is NOAA and 7% each say it is LimnoTech or the U.S. Environmental Protection Agency. The remaining respondents work at a variety of federal, state, regional, and local agencies and organizations.

Figure 1: What is your agency/organization name?



When asked which states fall under their area of responsibility, nearly half of respondents (48%) say that they work federally and therefore all states are under their responsibility. About one-third (32%) of respondents say Ohio falls under their area of responsibility while about one-quarter (26%) say Michigan does. Smaller amounts of respondents say that Wisconsin (10%), Indiana (10%), Minnesota (6%), Pennsylvania (3%), New York (3%), Illinois (3%), or another state (6%) fall under their area of responsibility.

Figure 2: What state(s) fall under your area of responsibility? (Select all that apply)



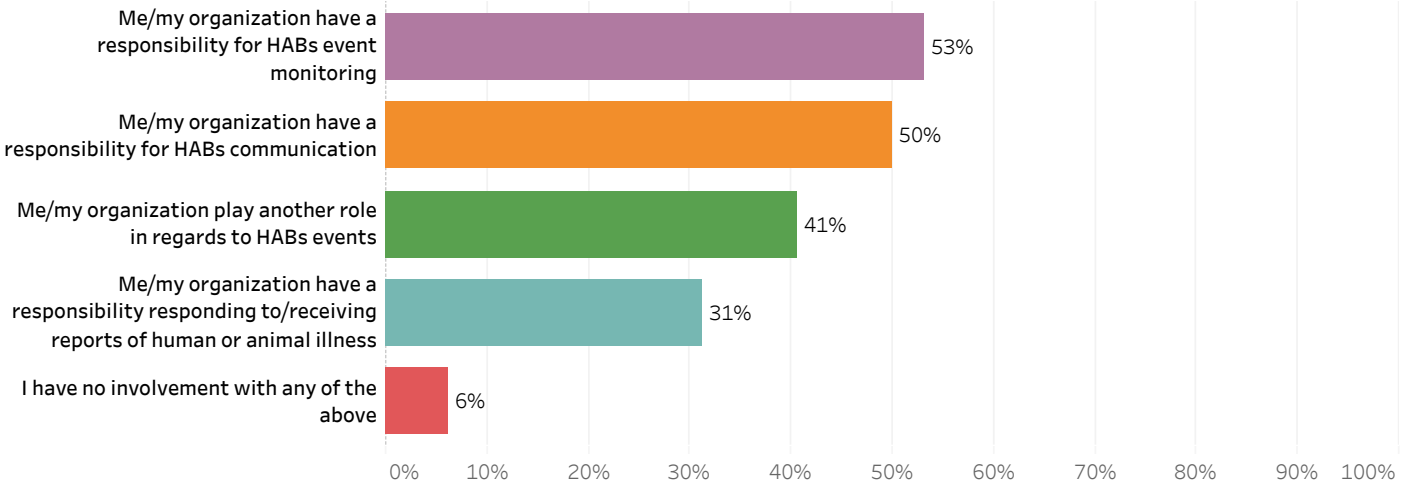
When asked which major bodies or water fall under their area of responsibility, respondents had a variety of responses, with many citing all Great Lakes or individual Great Lakes.

Figure 3: What major bodies of water fall under your area of responsibility?

500 inland lakes and reservoirs
All 5 Great Lakes
All coastal, including Great Lakes
All Ohio State Park lakes, areas of Lake Erie/Ohio River/ and navigable streams.
All tributaries to the Great Lakes
All U.S. Coastal and Great Lakes waters.
All water bodies within the boundaries of Midwestern National Park units
Coastal areas and Great Lakes
Great Lakes and associated freshwater aquatic habitats.
Great Lakes and Coastal US
Great Lakes, Chesapeake Bay, MRB, LCB, Lake Okeechobee
Great Lakes, Lake Champlain, Lake, Okeechobee, Hudson River, multiple estuaries and harbors
Jurisdictional surface waters of Ohio.
Lake Erie
Lake Erie, Maumee River, and Ottawa River. We have an MOU to provide a fire boat from the Port of Detroit to the Port Cleveland.
Lake Michigan, Lake Superior, Lake Huron, Lake Erie
Lake Michigan, Mona Lake, Muskegon Lake, Bear Lake, White Lake, Muskegon River, Spring Lake (East end), and many smaller inland lakes.
Laurentian Great Lakes
Muskegon Lake, White Lake, Lake Michigan
None
None from a regulatory standpoint, but we support states in their activities related to HABs and waterborne disease prevention throughout the United States.
Research capacity: Surface waters, ground waters including Great Lakes
The Great Lakes
The Great Lakes and St. Lawrence River through Trois Riviere
The Ohio Department of Health evaluates illness reports linked to all bodies of water in Ohio (inland and Lake Erie). ODH supports local jurisdictions in response to bloom reports at any Ohio water body.
Those watersheds within the City of Toledo which drain to the Maumee River and Lake Erie
We don’t focus on specific bodies of water. We are interested in all water resources for public drinking/recreation as well as ecological purposes
We’ve supported work in Lake Superior, Michigan, Huron, Erie, and Ontario. Primarily our work is in Michigan, Erie, and Huron.
West Michigan watersheds that flow into Lake Michigan
Western Lake Erie Basin

About half of respondents say they or their organization have a responsibility for HABs event monitoring (53%) and HABs communication (50%). Forty-one percent say they or their organization plays another role in regards to HABs events, 31% say they or their organization has a responsibility responding to or receiving reports or human and animal illness, and 6% have no involvement with any of the above.

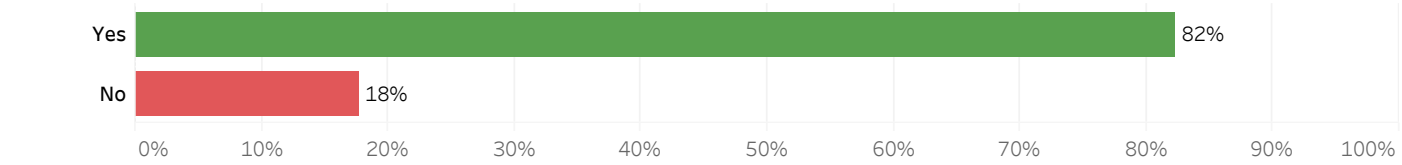
Figure 4: Please select you/your organization's role(s) regarding HABs events: (Select all that apply)



HABs Event Monitoring

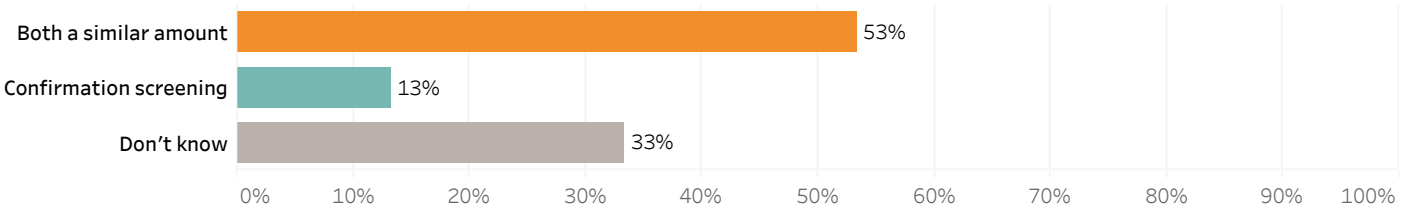
Among respondents who say they or their organization has a responsibility for HABs event monitoring (N=17), 82% say they or their organization routinely collects samples during a HABs event while 18% do not.

Figure 5: Do you or your organization routinely collect samples during a HABs event?



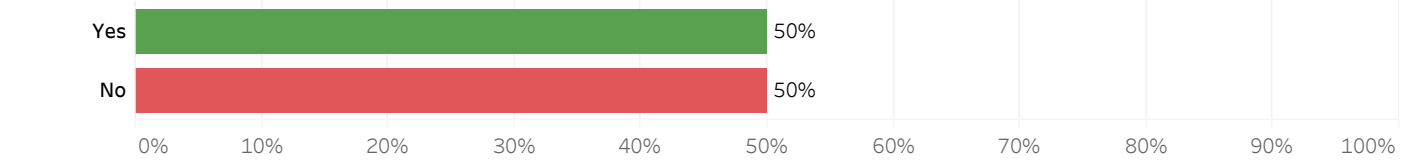
When asked whether they conduct usually confirmation screening or testing, more than half (53%) say they conduct both a similar amount, only 13% say they usually conduct confirmation screening only, no respondents say they usually conduct testing only, and 33% don't know.

Figure 6: Do you usually conduct confirmation screening or testing?



Half of respondents (50%) say they have in-house capability to test for cyanotoxins while half (50%) do not.

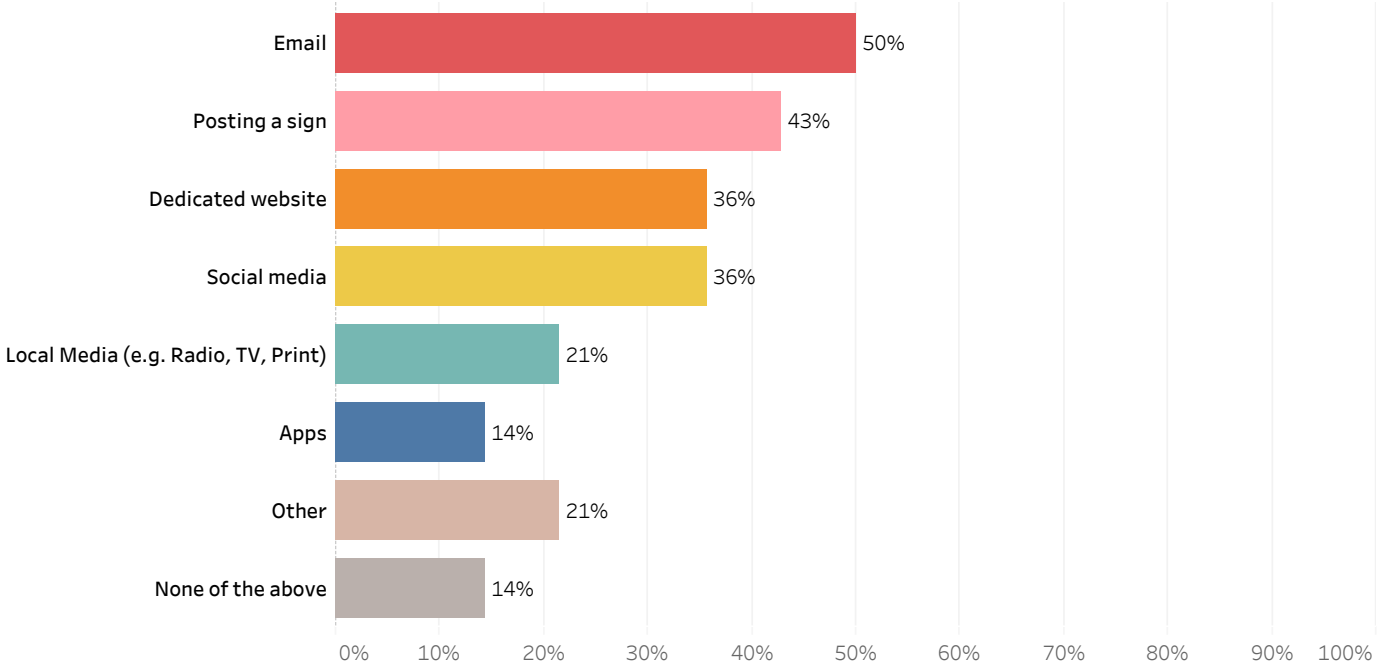
Figure 7: Do you have in-house capability to test for cyanotoxins?



HABs Communication

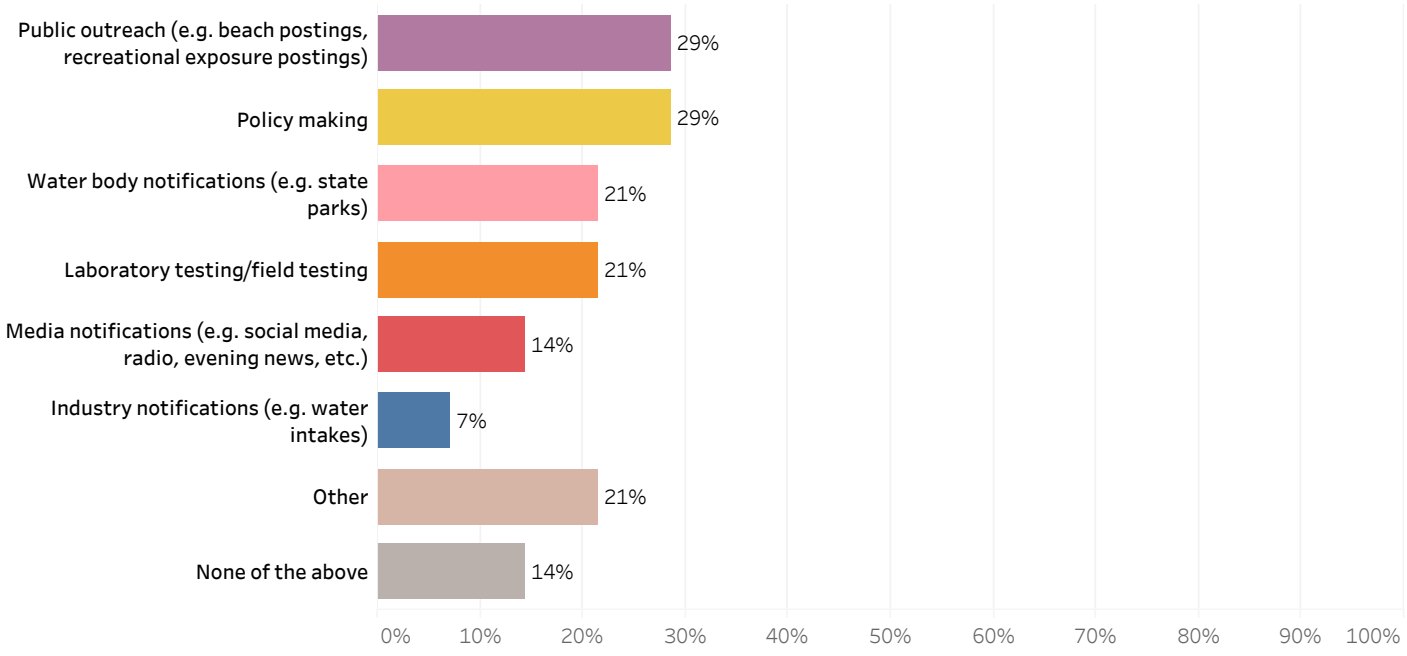
Among respondents who say they or their organization has a responsibility for HABs Communication (N=15), half (50%) say they communicate risk to stakeholders during an event through email 43% post a sign, 36% each use a dedicated website or social media, 21% use local media (Radio, TV, Print), 14% use Apps, 21% use something else, and 14% use none of the above.

Figure 8: In what ways do you communicate HABs risk to stakeholders during an event? (Select all that apply)



Twenty-nine percent of respondents each describe their role during a HABs event in their region as public outreach or policy making, 21% each describe it as water body notifications or laboratory or field testing, 14% describe it as media notifications, and 7% describe it as industry notifications. Twenty-one percent describe their role as something else, and 14% say none of the above describe their role.

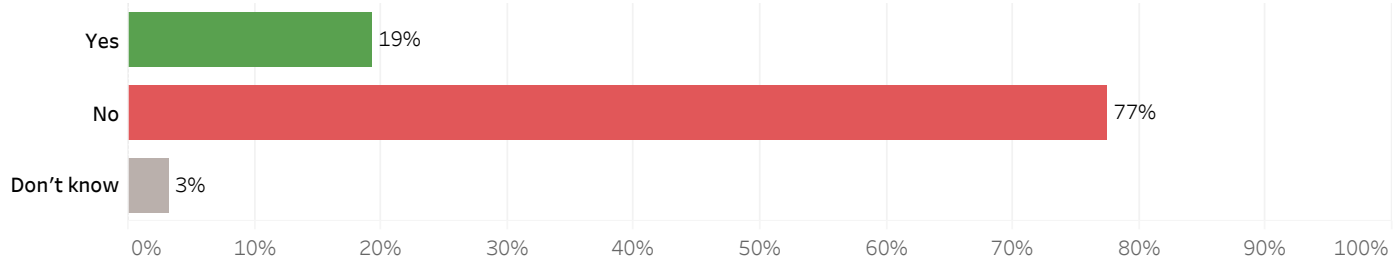
Figure 9: Which of the following best describe your role during a HABs event in your region? (Select all that apply)



HABs Event Experience

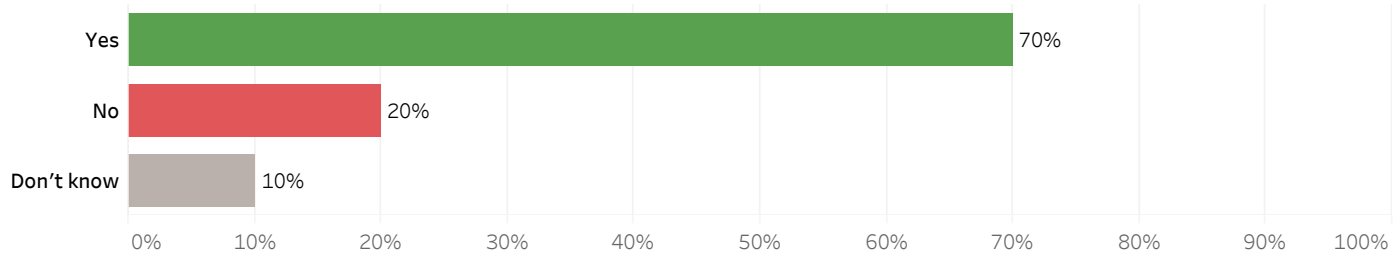
Just 19% of respondents have ever been involved in a HABs related preparedness exercise, 77% have not been involved in such an exercise, and 3% don't know.

Figure 10: Have you ever been involved in a HABs related preparedness exercise (e.g. tabletop exercise)?



Seven in ten (70%) have ever been involved in an actual HABs event, 20% have not, and 10% don't know.

Figure 11: Have you ever been involved in an actual HABs event?



Respondents who have been involved in a HABs event were asked to provide the site, year, and their responsibility in up to three recent HABs events that they were involved in. Those responses are below and on the following page:

Figure 12a: Below please enter the following information about up to three most recent HABs events you were involved in: (Site, Year, Responsibility)

Barker's Island, Duluth-Superior harbor (inlet of Lake Superior), MN/WI	2021	Confirmation of bloom and characterization of constituent cyanobacterial species.
Camp Wesley Lake	2022	Event was a reported bloom. ODH communicated event and provided instruction to local jurisdictions.
Erie	2015	Monitor
	2016	Monitor
	2020	Research, monitoring, modeling
	2021	Research, monitoring, modeling
	2022	Research, monitoring, modeling
		Monitor
Gulf Coast, Florida	2017-2018	Researcher into post-HAB effects on fisheries ecosystem
Indian Lake	2022	Event was a reported bloom. ODH communicated event and provided instruction to local jurisdictions.
Kamchatka Peninsula, Russia	2020	Coordination with NOAA, State Department, and other Federal agencies

Figure 12b: Below please enter the following information about up to three most recent HABs events you were involved in: (Site, Year, Responsibility)

Lake Erie	2014	Assisted State of Ohio in cyanotoxin sample preparation and detection method interpretation
Lake Okeechobee	2016	Cyanobacteria movement in lake and rivers and later studied effects of salinity on bloom lysis and toxin release
Lake Superior - Apostle Islands	2018	Collecting samples; talking with press and public
Lakes in KS, OH, and PA	2019-2022	Assist Districts with using remote sensing tools for HAB monitoring
Lower Chesapeake Bay	2022	Coordination and funding to assist event response
Madison Lake	2022	Event was a reported bloom. ODH communicated event and provided instruction to local jurisdictions.
Milford Lake	2011	Measured cyanotoxins in lake and 170 miles of Kansas River
Mona Lake	19	coordination
Muskegon Lake	21-22	public notice, postings, coordination
	2021	Reported bloom to Local Health Dept and the State of Michigan
		Coordinated with NOAA of hyperspectral over flight
	2022	Reported bloom to Local Health Dept and the State of Michigan
Northern Gulf Coast	2019	providing situational awareness to local partners with remote sensing
San Francisco Bay	2022	Coordination and funding to assist event response
	current	research
Southern California coastal	2022	Coordination and funding to assist event response
St. Croix	2022	Assist with emergency response using remote sensing to locate floating algal mats affecting the operation of a water desalination plant
West Coast, United States	2014-2015	Researcher into post-HAB effects on fisheries ecosystems
Western Lake Erie	2017	research monitoring
	2018	research monitoring
	2019	research monitoring
White Lake	20-22	public awareness, posting, coordination
Zurich, Switzerland	2012	Interpretation and public communication of findings of UZH and partner institutions regarding recent Planktothrix blooms (at ”Scientifica”).

Figure 13: In your experience, how, if at all, could communication during HABs events be improved?

Basically the communication related to toxicity could be greatly improved. The first thing most people want to know when there is a HAB is if it's a toxic risk or not. But that may require more science/research before we can adequately answer these questions: Is it toxic? Is it not? How broadly are the toxic exposures likely to be? What is the risk from toxin exposures (dermal, inhalation, ingestion) for humans and other life?
Centralized dashboards and lake warnings
Continued engagement of stakeholders and integration of smartphone technologies.
Develop a State-wide alert system. For example, we have BeachGuard for E.coli alerts.
Ensuring that the groups analyzing the data are aware of what data can be collected and clearly define what data should be collected
Greater coordination among Federal, State, local parties; greater understanding of response capabilities, assets, and approaches among Federal, State, local parties. Established networks and broader communication of resource availabilities for responding to HAB events.
National HAB communication portal that accepts environmental, laboratory, and QA data, methods, journal articles, reports on events or information that might assist in preparation or response to events (e.g. laboratory networks for sample submission)
Pre-incident planning and coordination are key. Not every bloom can be fully anticipated but to the extent possible it's great to lay the coordination groundwork for sampling and communication ahead of time.
Standardize messaging and have specific spokespeople
Standardize the reporting so that media have less flexibility in messaging and make it more like weather reporting - so the critical public health information gets out there without value statements that put people off politically.
Sub regional status and forecast phone-friendly products/alerts (e.g., Maumee Bay, Michigan shore of L. Erie)
We could learn from the structure for declaring Unusual Mortality Events (UMEs) for marine mammals. They have a group of experts that declares an event, a national coordinator, and an on-site coordinator. Only the coordinators, who have training and experience, are allowed to speak to the press and the public, so there is only one message. Information is provided quickly and accurately with sensationalism. Invite someone from the Office of Protected Species who has lots of experience with UMEs (some of which are caused by HABs). The model may not be perfect for HABs, but may provide some ideas.
We currently monitor beaches for E. coli and would like a similar program established for HABs.

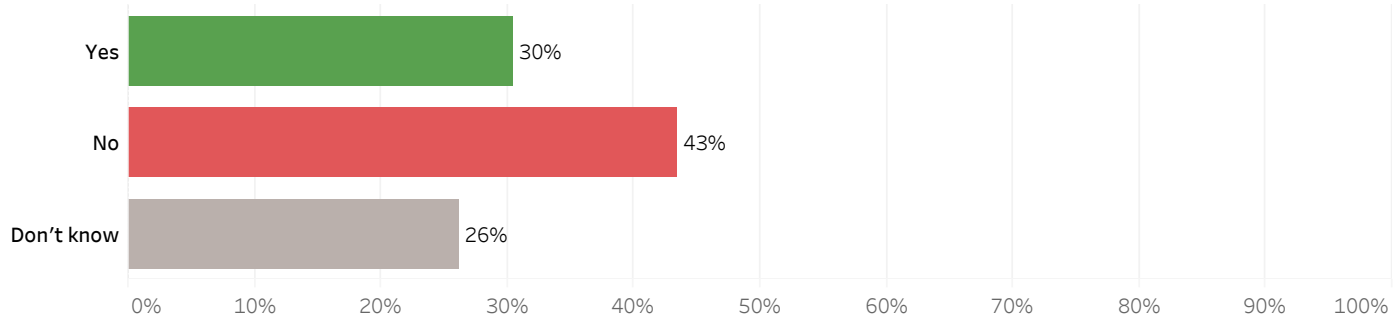
Figure 14: Do you have any lessons learned from a previous HABs event that could be useful to the planners of the upcoming workshop?

As long as experts are as willing to listen, learn, explain, and entertain as they are to instruct and convince, public engagement is necessary and constructive.
Clearly defining roles and responsibilities is very important.
Having pre-existing contacts, materials, and processes that are up to date to support detection, investigation, and response activities is helpful. Preparing for HAB events also includes preparing for human and animal health events and related concerns (e.g., coordination involving state and local health departments).
It's relatively easy to shut down a drinking water intake or close a beach or lake to recreation while there is an active bloom. However, those actions come at potential great economic loss. It's hard to find the information needed to weigh the risks of exposure with the economic losses due to unneeded interventions.
Not necessarily from a previous HAB event - but I would recommend consulting the information/recommendations in the proceedings from the 2021 HAB Preparedness and Response Workshop.
details. In Ohio, our Sea Grant program has an annual science writers workshop that is very helpful. Most members of the public still seem to get most of their information about HAB events through traditional media outlets, especially if it is a significant enough event
Several. 1. Always collect extra sample and hold it back preserved in case shipments are lost. 2. Communicate with laboratories prior to shipment so samples are preserved correctly and shipments are expected. 3. Know the purpose of sampling (e.g. worst case scenario, representative, human, animal health exposure scenario concerned with, independent verification). 4. Try to have a relationship with people prior to a crisis. Communication is not easier after a crisis starts. 5. Know what lane the agencies/stakeholders are supposed to be in. 6. Know who will do the messaging and what the messages will be. 7. Know the approval process for joint messaging. Is there a fast-track process?
There is a plan for HAB event response developed in 2008, which has never been implemented but is still relevant. See Chapter 3 in the following document: HAB RDDTT. 2008. Harmful Algal Bloom Research, Development, Demonstration, and Technology Transfer National Workshop Report. Dortch, Q., Anderson, D.M., Ayres, D.L., Glibert, P.M. (Eds)., Woods Hole, Massachusetts. https://hab.whoi.edu/wp-content/uploads/2018/05/RDDTT_National_Workshop_Report_Final_43464.pdf
We need more cyanotoxin testing capability and monitoring
Yes, too many to list here, happy to chat jbratton@limno.com

HABs Response Plans

Three in ten respondents (30%) say their agency or organization has existing HAB response plans, policies, or procedures as it relates to public outreach or hazard communication, 43% do not have such plans, policies, or procedures, and 26% don't know.

Figure 15: Does your agency or organization have existing HAB response plans, policies, or procedures as it relates to public outreach or hazard communication?



Among respondents who have HAB response plans, policies, or procedures (N=7), 43% say they are available online, 43% say they are not available online, and 14% don't know or are not sure.

Figure 16a: Are your HAB response plans, policies, or procedures available online?

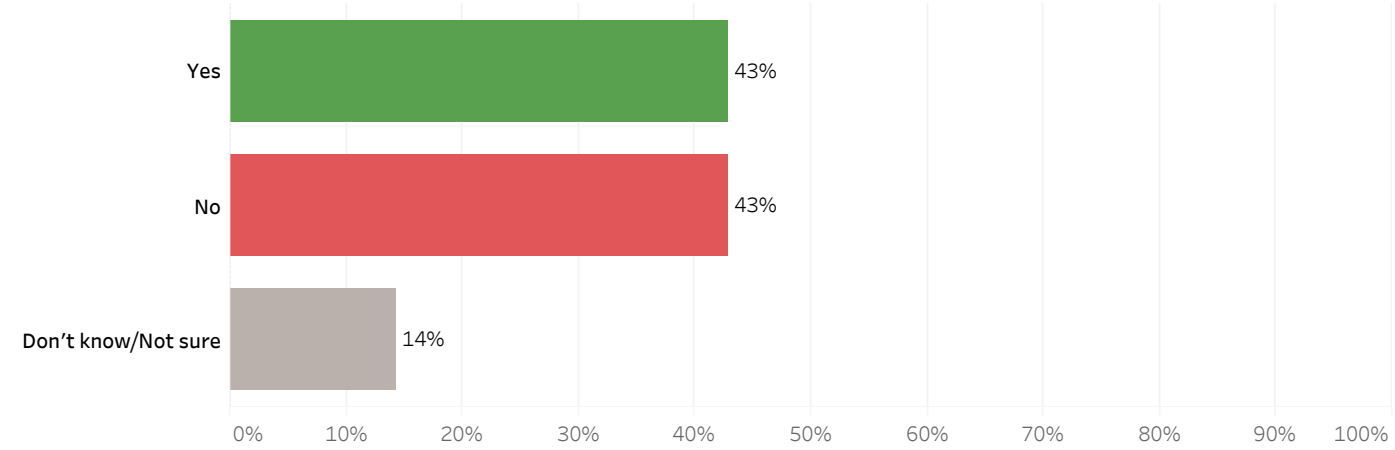


Figure 16b: Are your HAB response plans, policies, or procedures available online? - Yes - Specify URL

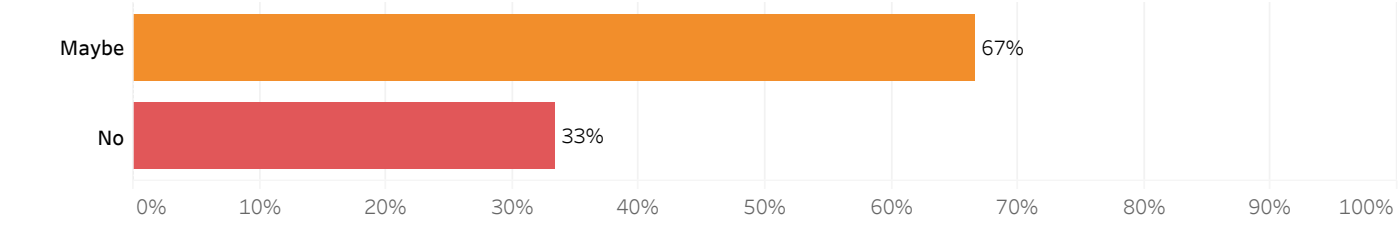
https://coastalscience.noaa.gov/research/stressor-impacts-mitigation/rapid-response/#eventresponse

https://epa.ohio.gov/static/Portals/35/hab/HABResponseStrategy.pdf?ver=2020-10-28-164629-413

they vary by state and state agency

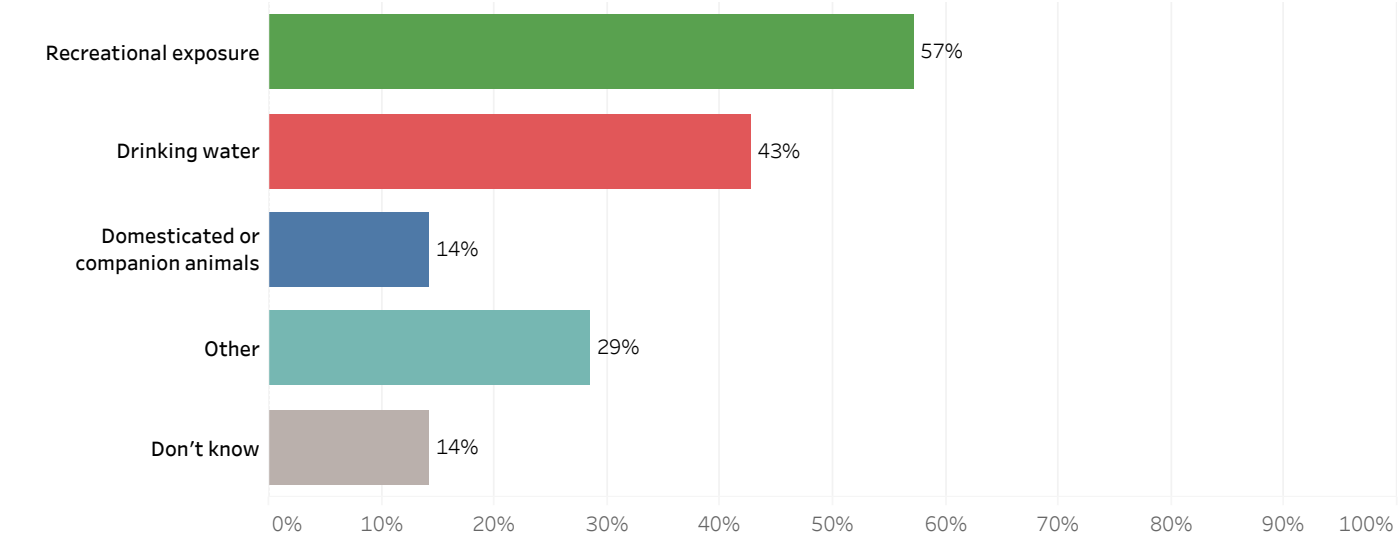
Two-thirds of applicable respondents (67%) say they may be willing to share these plans, policies, or procedures with the workshop organizers prior to the workshop while 33% would not be willing to do so.

Figure 17: Would you be willing to share these plans, policies, or procedures with the workshop organizers prior to the workshop?



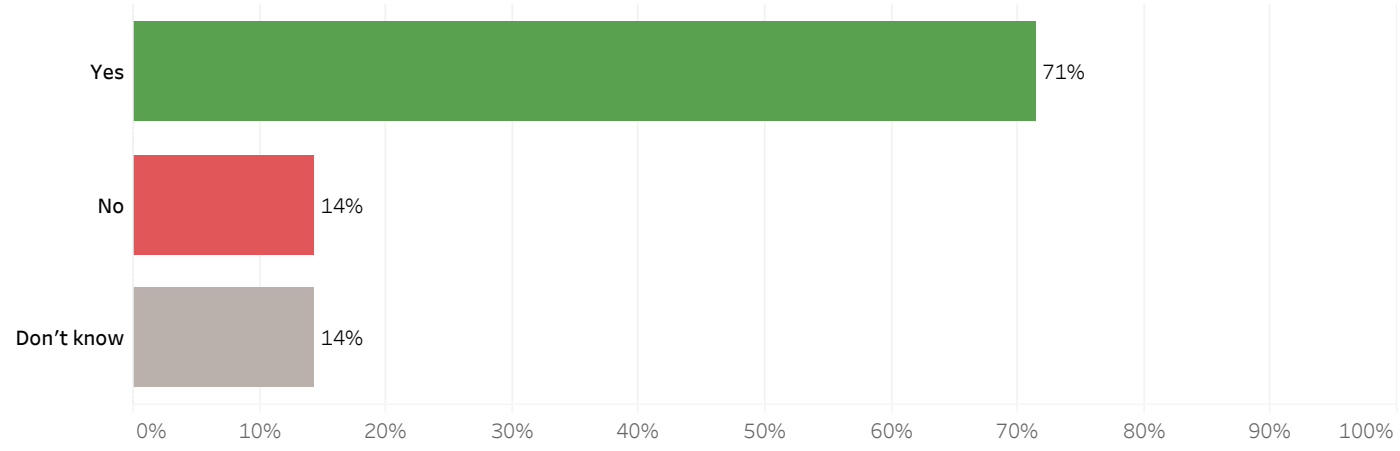
Over half of respondents (57%) say their agency/organization has threshold values for cyanotoxins for recreational exposure, 43% have them for drinking water, and 14% have them for domesticated or companion animals. Twenty-nine percent say they have threshold values for something else and 14% don't know.

Figure 18: Does your agency/organization have threshold values for cyanotoxins for any of the following? (Select all that apply)



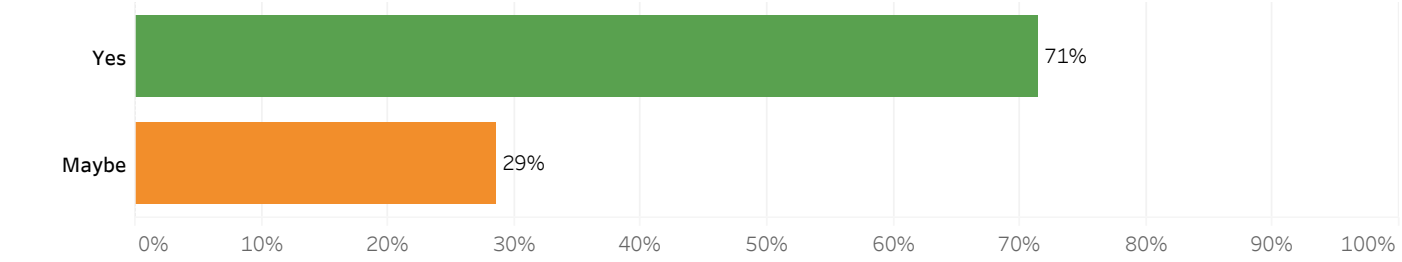
Seven in ten (71%) say their agency or organization can receive reports from the public regarding suspected blooms, 14% say their agency or organization cannot do this, and 14% don't know.

Figure 19: Can your agency/organization receive reports from the public regarding suspected blooms ?



Among respondents who have HAB response plans, policies, or procedures (N=7), seven in ten (71%) say they are interested in participating in the upcoming workshop while 29% are maybe interested in participating.

Figure 20: Would you be interested in participating in the upcoming workshop?



Twenty-nine percent would be willing to present their HAB response, plans, policies, or procedures at the upcoming workshop, 29% may be willing to do so, and 43% are not willing to do so.

Figure 21: Would you be willing to present your HAB response plans, policies, or procedures at the upcoming workshop?

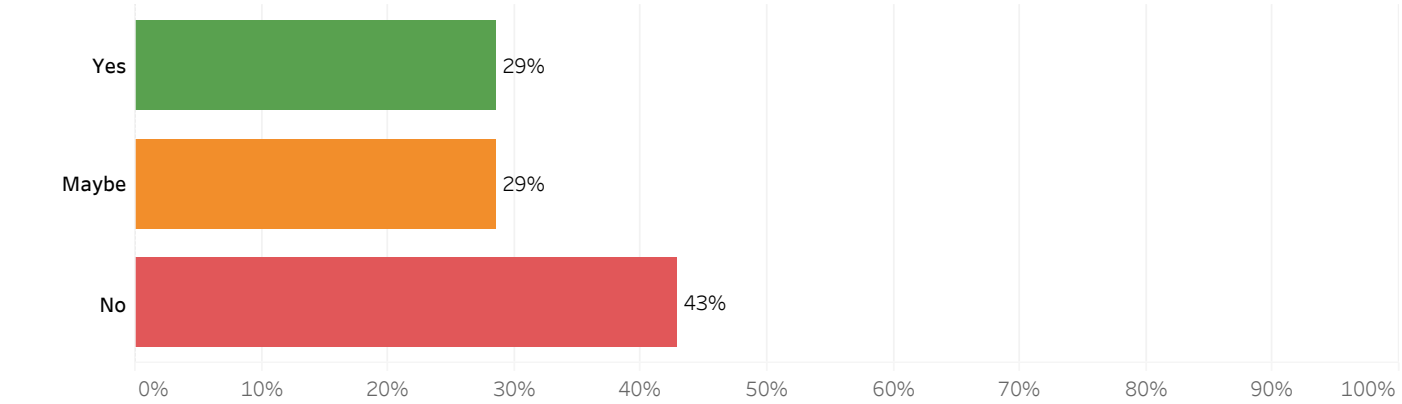


Figure 22: Contact information of potential presenters at the upcoming workshop

Would you be willing to present your HAB response plans, policies, or procedures at the upcoming workshop?	Name	Phone	Email
Yes	Keith Loftin	785-764-1408	kloftin@usgs.gov
Yes	Quay Dortch	240/560-3971	Quay.Dortch@noaa.gov
Maybe	Aabir Banerji	218-529-5238	banerji.aabir@epa.gov
Maybe	Michael Eslick	231.724.1253	eslickmi@co.muskegon.mi.us

Appendix A

HAB Survey

INT
NOAA will host the Great Lakes Harmful Algal Bloom Communication Preparedness Workshop virtually from December 6-8, 2022. The workshop will be applicable to multiple HAB threats including public health (drinking water, recreational water), aquatic life, agriculture, well impacts, dredging material impacts, and benthic blooms. The objectives of this workshop are to ensure effective coordination and communication across relevant agencies and to understand lessons learns from case studies and their relevance to emerging HAB locations and apply them to current and emerging threats.

Your answers to this survey will help inform the planning process for this workshop. Thank you very much for your assistance.

Q1 What is your agency/organization name?

_____

Q2 What state(s) fall under your area of responsibility? (Select all that apply)

- ☐ Illinois (1)
- ☐ Indiana (2)
- ☐ Michigan (3)
- ☐ Minnesota (4)
- ☐ New York (5)
- ☐ Ohio (6)
- ☐ Pennsylvania (7)
- ☐ Wisconsin (8)
- ☐ Federal/All States (9)
- ☐ Other - Specify: (10) _____

Q3 What major bodies of water fall under your area of responsibility?

_____

_____

_____

_____

_____

Q4 Please select you/your organization's role(s) regarding HABs events: (Select all that apply)

- ☐ Me/my organization have a responsibility for HABs event monitoring (1)
- ☐ Me/my organization have a responsibility for HABs communication (2)
- ☐ Me/my organization have a responsibility responding to/receiving reports of human or animal illness (3)
- ☐ Me/my organization play another role in regards to HABs events - specify (4) _____
- ☐ ⊗ I have no involvement with any of the above (5)

Display This Question:

If Please select you/your organization's role(s) regarding HABs events: != I have no involvement with any of the above

Q5 Do you or your organization routinely collect samples during a HABs event?

- ○ Yes (1)
- ○ No (2)
- ○ Don't know (3)

Display This Question:

If Please select you/your organization's role(s) regarding HABs events: != I have no involvement with any of the above

Q6 Do you usually conduct confirmation screening or testing?

- Confirmation screening (1)
- Testing (2)
- Both a similar amount (3)
- Don't know (4)

Q7 Do you have in-house capability to test for cyanotoxins?

- Yes (1)
- No (2)
- Don't know (98)

Q8 In what ways do you communicate HABs risk to stakeholders during an event? (Select all that apply)

- ☐ Social media (1)
- ☐ Posting a sign (2)
- ☐ Email (3)
- ☐ Dedicated website (4)
- ☐ Local Media (e.g. Radio, TV, Print) (5)
- ☐ Apps (6)
- ☐ Other - specify (97) _____
- ☐ ⊗ None of the above (96)

Q9 Which of the following best describe your role during a HABs event in your region? (Select all that apply)

- ☐ Public outreach (e.g. beach postings, recreational exposure postings) (1)
- ☐ Policy making (2)
- ☐ Industry notifications (e.g. water intakes) (3)
- ☐ Water body notifications (e.g. state parks) (4)
- ☐ Media notifications (e.g. social media, radio, evening news, etc.) (5)
- ☐ Laboratory testing/field testing (6)
- ☐ Other - specify (97) _____
- ☒ None of the above (96)

Q10 Have you ever been involved in a HABs related preparedness exercise (e.g. tabletop exercise)?

- ○ Yes (1)
- ○ No (2)
- ○ Don't know (3)

Q11 Have you ever been involved in an actual HABs event?

- ○ Yes (1)
- ○ No (2)
- ○ Don't know (3)

Skip To: End of Block If Have you ever been involved in an actual HABs event? != Yes

Display This Question:

If Please select you/your organization's role(s) regarding HABs events: != I have no involvement with any of the above

Q12 Below please enter the following information about up to three most recent HABs events you were involved in:

	Site (1)	Year (2)	Describe your responsibilities (3)
Event #1 (1)			
Event #2 (2)			
Event #3 (3)			

Q13 In your experience, how, if at all, could communication during HABs events be improved?

_____

_____

_____

_____

_____

Display This Question:

If Please select you/your organization's role(s) regarding HABs events: != I have no involvement with any of the above

Q14 Do you have any lessons learned from a previous HABs event that could be useful to the planners of the upcoming workshop?

_____

_____

_____

_____

_____

Q15 Does your agency or organization have existing HAB response plans, policies, or procedures as it relates to public outreach or hazard communication?

- ○ Yes (1)
- ○ No (2)
- ○ Don't know (3)

Skip To: End of Block If Does your agency or organization have existing HAB response plans, policies, or procedures as it... != Yes

Q16 Are your HAB response plans, policies, or procedures available online?

- ○ Yes - please specify url (1) _____
- ○ No (2)
- ○ Don't know/Not sure (3)

Display This Question:

If Are your HAB response plans, policies, or procedures available online? = No

Q17 Would you be willing to share these plans, policies, or procedures with the workshop organizers prior to the workshop?

- ○ Yes (1)
- ○ Maybe (2)
- ○ No (3)

Q18 Does your agency/organization have threshold values for cyanotoxins for any of the following? (Select all that apply)

- ☐ Drinking water (1)
- ☐ Recreational exposure (2)
- ☐ Domesticated or companion animals (3)
- ☐ Other - specify (4) _____
- ☐ Don't know (5)

Q19 Can your agency/organization receive reports from the public regarding suspected blooms ?

- Yes (1)
- No (2)
- Don't know (3)

Q20
As stated earlier, NOAA will host the Great Lakes Harmful Algal Bloom Communication Preparedness Workshop virtually from December 6-8, 2022.

Would you be interested in participating in the upcoming workshop?

- Yes (1)
- Maybe (2)
- No (3)

Display This Question:

If As stated earlier, NOAA will host the Great Lakes Harmful Algal Bloom Communication Preparedness... = Yes

Or As stated earlier, NOAA will host the Great Lakes Harmful Algal Bloom Communication Preparedness... = Maybe

Q21 Would you be willing to present your HAB response plans, policies, or procedures at the upcoming workshop?

- Yes (1)
- Maybe (2)
- No (3)

Display This Question:

If Would you be willing to present your HAB response plans, policies, or procedures at the upcoming... = Yes

Or Would you be willing to present your HAB response plans, policies, or procedures at the upcoming... = Maybe

Q22 Thank you for your interest! Please provide the following contact information below so that the workshop organizers can contact you about potentially presenting at the workshop:

- Name (1) _____
- Phone (2) _____
- Email (3) _____

Appendix E: Participant Directory

Great Lakes HABs Communication Preparedness Workshop Directory of Participants

Name	Organization	AOR	Email
Chris Winslow	**Ohio Sea Grant**		winslow.33@osu.edu
John Bratton	Limno Tech	All	jbratton@limno.com
Keith Loftin	USGS	All	kloftin@usgs.gov
Whitney King	EPA	Erie	king.whitney@epa.gov
Ebie Holst	Cleveland Water Alliance	Erie	eholst@clewa.org
Abby Buchhop	Lucas County Emergency Management	Erie	ema@co.lucas.oh.us
Brook Decubellis	USDA	Erie	brooke.decubellis@usda.gov
LaShawna Weeks	Toledo Division of Environmental Services	Erie	lashawna.weeks@toledo.oh.gov
Elizabeth Striano	MISG	Huron	estriano@umich.edu
Jennifer Thum	Indian State Dept of Agriculture	Michigan, Erie	jthum@isda.in.gov
Dominic Libera	US FWS	Superior	dominic.libera@fws.gov
Gina LaLiberte	Wisconsin DNR	Superior, Michigan	gina.laliberte@wisconsin.gov
Kurt Kesteloot	USPHS / NPS	Superior, Michigan, Erie	kurt_kesteloot@nps.gov
Greg Schoor	NOAA	All	gregory.m.schoor@noaa.gov
Reagan Errera	NOAA		reagan.errera@noaa.gov
Kaytee Pokrzywinski	NOAA	Erie	kaytee.boyd@noaa.gov
Margo Schulze-Haugen	NOS	Erie	margo.schulze-haugen@noaa.gov
Ruth Kelty	NOAA	Erie	ruth.kelty@noaa.gov
Rachel Pryor	**NOAA (reassigned post-workshop)**		rachel.l.pryor@noaa.gov
Charlie Henry	NOAA DPP DRC	All	charlie.henry@noaa.gov
Deborah Lee	NOAA	All	deborah.lee@noaa.gov
Michael Posadny	Toledo Fire and Rescue	Erie	michael.posadny@toledo.oh.gov
Justin Chaffin	Ohio State Stone Lab	Erie	chaffin.46@osu.edu
Benjamin Pushka	Board of Lucas County Commissioners	Erie	bpushka@co.lucas.oh.us
Mandy Michalsen	USACE	Erie	mandy.m.michalsen@usace.army.mil
Michelle Selzer	Michigan Dep. of Agriculture & Rural Develop	Erie	selzerm@michigan.gov
Candace Rutt	CDC	Michigan	awr8@cdc.gov
Susan Peters	Michigan Dep. of Health & Human Services	Superior, Michigan, Huron, Erie	peterss@michigan.gov
Jordan Murray	Wisconsin Division of Public Health	Superior, Michigan	jordan.murray@dhs.wisconsin.gov
Geneva Langeland	Michigan Sea Grant	Superior, Michigan, Huron, Erie	genlang@umich.edu
Jeanine McCloskey	Oakland County (MI)	Erie, Ontario	mccloskeyj@oakgov.com
Janelle Teeters Mead	OFSWCD	Erie	jmead@frankinswcd.org
Terri Jicha	EPA	All	jicha.terri@epa.gov
Ruth Briland	US EPA	Erie	ruth.briland@epa.ohio.gov
Tiffany Vance	NOAA	Erie	tiffany.c.vance@noaa.gov
Callie Nauman	Ohio EPA	Erie	
David Fitch	GLOS	Michigan	david@glos.org
Natalie Foos	Ohio DNR	Erie	natalie.pirvu@dnr.ohio
Felix Martinez	**NOAA**		felix.martinez@noaa.gov
Virginia Roberts	CDC	All	evl1@cdc.gov
Aabir Banerji	EPA	All	banerji.aabir@epa.gov
Mary Anne Evans	USGS	Michigan, Huron, Erie, Ontario	maevans@usgs.gov
Jon Hortness	USGS	All	hortness@usgs.gov
James Antolick	TBD Economics LLC	All	
Ana Sirviente	GLOS	All	ana@glos.org.
Maggie Broadwater	NOAA	All	maggie.broadwater@noaa.gov
Joy Mulinex	Ohio Lake Erie Commission	Erie	joy.mulinex@governor.ohio.gov
Beth Land	EPA	Michigan, Superior	
John Matousek	Michigan EGLE	Superior, Michigan, Huron, Erie	matousekj@michigan.gov
Dani McLaughlin	Kent State	Erie	dmclau12@kent.edu
Madeline Magee	Wisconsin DNR	Superior, Michigan	madeline.magee@wisconsin.gov
Micah Bennett	EPA	All	bennett.micah@epa.gov
Chiara Zuccarino-Crowe	Michigan Sea Grant	All	chiara.zuccarino-crowe@noaa.gov
Tom Zimnicki	Alliance for the Great Lakes	All	tzimnicki@greatlakes.org
Michelle Harmon	NOAA	All	michelle.harmon@noaa.gov
Doug Deardorff	USDA	Ohio	doug.deardorff@usda.gov
Christine Kosmowski	Michigan Dept Health	Michigan	kosmowskic@michigan.gov
Fallon Chabala	West Michigan Shoreline Regional Developme	Michigan	fchabala@wmsrdc.org
Jennifer Day	**NOAA**		jennifer.day@noaa.gov
Andrea Ania	US Forest Service	Michigan	aania@fs.fed.us
Keri Fisher	Michigan Dep. of Health & Human Services	All	fisherk@michigan.gov
Christen Hayes	Oakland County Health Division	Erie	
David Kidwell	NOAA	All	david.kidwell@noaa.gov
Xavier Mayali	Lawrence Livermore National Laboratory	Erie	mayali1@llnl.gov
Wendy Drake	EPA	Erie	drake.wendy@epa.gov
Bryce Kerr	Ohio Department of Health	Erie	bryce.kerr@odh.ohio
Deborah McArthur	OCHD / EHS	Erie	
Katie Flahive	EPA	Michigan	flahive.katie@epa.gov
Lisa Fogarty	USGS	Michigan, Superior, Huron, Erie	lrfogart@usgs.gov
Michele Schalow	Michigan Dep. of Agriculture & Rural Develop	Superior, Michigan, Huron, Erie	schalowm@michigan.gov
Diane Packett	Wisconsin DNR	Superior, Michigan	dianel.packett@wisconsin.gov
Richard Peresky	OCHD	Huron, Erie	
Shannon Nabors	Ohio EPA	Erie	shannon.nabors@epa.ohio.gov
Erica Clites	Mighigan Sea Grant	Erie	clitese1@msu.edu
Wendy Drake	US EPA	Erie	drake.wendy@epa.gov
Bridget Weimer	NOAA	All	bridget.weimer@noaa.gov
Stacy Furgal	NYSG	Erie, Ontario	slf85@cornell.edu
Michael Eslick	Public Health Muskegon	Michigan	eslickmi@co.muskegon.mi.us
Gail Hesse	National Wildlife Federation	Ohio	hesseg@nwf.org

John Bratton	Limno Tech	Michigan	1
Elizabeth Striano	MISG	Michigan	1
Dominic Libera	US FWS	North Carolina	1
Gina LaLiberte	Wisconsin DNR	Wiconsin	1
Kurt Kesteloot	NPS	Nebraska	1
Reagan Errera	NOAA	Michigan	1
Margo Schulze-Haugen	NOS	Maryland	1
Ruth Kelty	NOAA	Colorado	1
Ruth Briland	Ohio EPA	Ohio	1
EOC Lucas County (2)		Ohio	1
Keri Fisher	Michigan Dep of Health	Michigan	1
Christen Hayes	Oakland County Health	Michigan	1
Charlie Henry	NOAA	Gulf of Mexico	2
Deborah Lee	NOAA	Michigan	2
Michael Posadny	Toledo Fire	Ohio	2
Mandy Michalsen	USACE	Mississippi	2
Michelle Selzer	Michigan Dep. Of Agriculture	Michigan	2
Candace Rutt	CDC	Georgia	2
Geneva Landeland	Michigan Sea Grant	Michigan	2
Jeanine McCloskey	Oakland County	Michigan	2
Natalie Foos	Ohio DNR	Ohio	2
David Fitch	GLOS	Michigan	2
Bryce Kerr	Ohio Dep of Health	Ohio	2
Richard Peresky	OCHD	Michigan	2
Micah Bennett	EPA	Illinois	2
Callie Nauman	Ohio EPA	Ohio	3
Christine Kosmowski	Michigan Dep Health	Michigan	3
Virginia Roberts	CDC	Georgia	3
Aabir Banerji	EPA	Minnesota	3
Jon Hortness	USGS	Illinois	3
Ana Sirveinte	GLOS	Michigan	3
Joy Mulinex	Ohio Lake Erie Comission	Ohio	3
John Matousek	Michigan EGLE	Michigan	3
Madeline Magee	Wisconsin DNR	Wisconsin	3
Chiara Zuccarino-Crowe	Michigan Sea Grant	Michigan	3
Michelle Harmon	NOAA	DC	3
Doug Deardorff	USDA	Ohio	3
Susan Peters	Michigan Dep of Health	Michigan	3
Greg Schoor	NOAA	Virginia	4
James Antolick	Economics	Maryland	4
Dani McLaughlin	Kent State	Ohio	4
Kaytee Pokrzywinski	NOAA	North Carolina	4
Mary Anne Evans	USGS	Michigan	4
Andrea Ania	US Forest Service	Michigan	4

Xavier Mayali	Lawrence Livermore National Lab	California	4
Wendy Drake	EPA	Illinois	4
Lisa Fogarty	USGS	Michigan	4
Diane Packett	Wisconsin DNR	Wisconsin	4
Erica Clites	Michigan Sea Grant	Michigan	4
Michael Eslick	Public Health Muskegon	Michigan	4
Gail Hesse	National Wildlife Federation	Ohio	4

Michigan	5
Ohio	3
Health	2
Total	13

Michigan	6
Ohio	3
Health	2
Total	13

Michigan	5
Ohio	3
Health	2
Total	13

Michigan	5
Ohio	2
Health	1

Total	13