

Harmful Algal Blooms Outreach in Michigan: Focus Group Feedback

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EXECUTIVE SUMMARY

Research Summary. The goal of this research was to gather and assess feedback from Michigan residents on three descriptions of harmful algal blooms (HABs) and three informational signs about HABs. The study also investigated Michiganders' perceptions, understanding, and experiences with HABs. To collect this data, the research team convened eight, two-hour online focus groups in March 2021 with Michigan residents who live or recreate on Michigan's lakes and rivers. During the focus groups, participants discussed their experiences with HABs, their perception of the issue, and how their lake associations have responded to HABs. Participants were then shown three descriptions of HABs and three signs and asked to provide their impressions and suggestions for improving the materials. The focus groups were transcribed, qualitatively analyzed for common themes, and summarized in the following report.

Findings. It is important to note that the feedback given in this report is not a list of policy recommendations from the research team. Rather, these findings are feedback expressed repeatedly across focus groups with at least some consensus within groups. This study's qualitative analysis developed the following key findings:

- **Identifying and Reporting HABs.** Those who do not have extensive experience with HABs often struggle to identify HABs, although seeing pictures of HABs boosts their confidence that they could at least identify a suspicious algal bloom. When lay people have questions about HABs, they often search the internet to find answers to specific questions. When they want to report the HAB, however, they often call, message, or visit a friend who is in the lake association or a friend who is knowledgeable about HABs to ask them how to report or to report the bloom for them. This is because they do not know who to call or email to report a suspicious bloom. One place where online reporting seems to work well is Black Lake where the local preservation society has developed an online reporting tool called [Eyes on the Lake](#), which many residents with smart phones use to report suspicious algal blooms. One limitation of this tool is that it was developed by the preservation society, thus those who are aware of it are limited to the preservation society members' social networks.
- **Repeated Questions about HABs.** Many people signed up for a focus group because they had questions about HABs. These questions fell into seven major categories: descriptions of HABs, risk of exposure, post-exposure, pet exposure, testing and reporting, causes of HABs, and preventing HABs. The full list of recurring questions is available in Table 2.
- **Local Politics of Lake Management.** Despite not being a planned subject of discussion, participants in all groups initiated an organic discussion about the causes and solutions to HABs, lamenting and debating the politicization of lake management. They saw a major divide between those who prefer chemical treatment and those who prefer to adopt land management practices to limit nutrient flow into the lake. Group members saw the lakeshore as a highly contested space where waterfront landowners exercise their own preference for water and land management practices. Ultimately, the groups decided that individuals' perceptions of the causes of HABs and potential solutions are strongly influenced by aspects

of their personal identity. Participants cited education, political position, past experiences with HABs, tolerance for risk, location on the lake, and their position in the watershed as some of the key factors that influence how they perceive HABs.

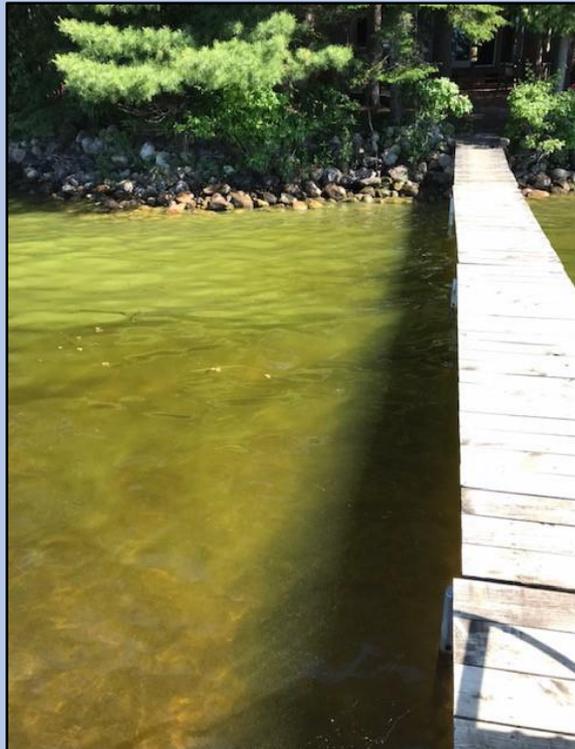
- **Feedback on MDHHS' CyanoHABs Outreach.** After discussing their experiences with HABs, participants gave feedback on the MDHHS' outreach materials, including three descriptions and three signs. While giving this feedback, participants questioned the state's responsibility to educate the public about environmental health risks, whether signs could be complemented with other forms of communication like postcards, and how the impact of HABs on human and pet health can be framed within a discussion of lake conservation.

In addition to this overarching feedback, participants also gave detailed impressions of the three descriptions and signs provided by the MDHHS. They then provided constructive feedback based on these impressions for the MDHHS to improve the descriptions and signs. This detailed feedback is available in Tables 3, 4, and 5.

1.0 INTRODUCTION

The goal of this research was to gather and assess feedback from Michigan residents on three descriptions of harmful algal blooms (HABs) and three informational signs about HABs. The study also investigated Michiganders' perceptions, understanding, and experiences with HABs. To collect this data, the research team convened eight, two-hour online focus groups in March 2021 with Michigan residents who live or recreate on Michigan's lakes and rivers. The focus groups were then transcribed and analyzed. This report describes the full findings from this study.

Figure 1. Picture of a HAB taken by a focus group participant on their lake



2.0 METHODS

This project is a follow-up study to a quantitative survey of Michiganders' knowledge and perceptions of HABs.¹ This qualitative study built on questions that arose from the survey and sampled from the original survey respondents.

2.1 Focus Group Sampling

In order to find a minimum of three participants for each of the eight focus groups, this study employed two rounds of sampling. In the first round, one invitation email and two reminder emails were sent to all those who took the original quantitative HABs survey. The quantitative study recruited survey respondents by reaching out to three lake association Facebook groups. This first round of sampling provided enough participants to hold four focus groups.

The second round of sampling took place after four focus groups had already been conducted. In a follow-up email, the focus group coordinator included a short paragraph about the study that participants from the first four focus groups could share with relevant friends or colleagues. In order to ensure that there would be Michigan residents from a variety of locations, the team then reviewed a list of lakes that have experienced HABs between 2017 and 2019. If a lake had experienced a HAB in all three years, then the team attempted to find a Facebook group for that lake or community. If a Facebook group existed, then we sent a message to the group's admins introducing ourselves and the study, then requested that they allow us to post an invitation to sign up for a focus group. These groups included the three Facebook groups that were recruited from for in the original quantitative survey sample, but also included additional lake association Facebook groups.

All recruitment messages included the information that those who participated in a focus group would receive \$50. Those who participated received a \$50 digital Visa gift card after the focus group to thank them for their time.

Figure 2. Facebook post on the Black Lake Preservation Society's Facebook page referenced in a focus group and shared with the coordinator

This is a great look for the Chicago River, but not so much for Black Lake when a green scummy Algal Bloom forms.

Homeowners can help and it won't cost you a penny.

Scoop your pets' poop

Don't buy fertilizer or apply it to your lawn.



¹ Van Fossen, Jenna A., John W. Ropp, Kathleen Darcy, Zachary Woessner, Amanda Isabel Osuna, Elizabeth Meier, and Joseph A. Hamm (2020). [CyanoHAB Outreach in Michigan: Survey Report](#). Michigan State University TRUSST Lab.

2.2 Focus Group Screening Survey

Those who received an invitation to participate were instructed to click on a link to an online screening survey that they had to complete before they could sign up for a focus group. (See Appendix 1.) The online survey was designed and run through Qualtrics and took about 10 minutes to complete.

The survey began with an informed consent form for only the survey. It then verified that the participant was 18 years or older and either lived or recreated on a lake or river in Michigan. If their responses indicated that they were ineligible, the respondent was not allowed to continue but was directed to more information about HABs on EGLE's website.

Next the survey requested feedback on MDHHS' "Warning" sign. If the respondent was willing to provide more feedback, they were then asked about the "Algae Awareness" and "Danger" signs. When the respondent no longer wanted to provide feedback or had provided feedback on all three signs, they were shown the informed consent form for the focus group. If they did not consent, they were deemed ineligible and shown more information on HABs. If they did consent and typed their name to document consent, then they were redirected to the study's Calendly website to sign up for one of the eight focus groups. This webpage was programmed to send automated confirmation and reminder emails to participants with a link to a Zoom meeting room.

2.3 Focus Groups

The focus groups were conducted and recorded on Zoom. The focus group coordinator ran the focus groups and communicated with participants before and after the focus group. The coordinator used a focus group guide (Appendix 2) to steer the conversation and probed to stimulate group discussion and investigate themes.

As the focus group started, the coordinator explained how to use Zoom, then reviewed the informed consent information and addressed any questions before discussion began. The coordinator then explained the research topic, introduced herself, and asked participants to briefly introduce themselves.

The coordinator then prompted the group to discuss how comfortable they felt identifying HABs and where they go with questions. Next participants transitioned to discuss their personal experiences with HABs, how they react when they see one, and whether and how they report a HAB. The participants were asked to compile a list of questions about HABs that they would like answered in a frequently asked question section on a website.

The focus group coordinator then transitioned to collect feedback on the MDHHS' descriptions and signs. The coordinator shared each description and sign, collecting first impressions, positive feedback, and critiques. (See Appendix 3 for slides shared with the groups.) After each positive or negative comment, the coordinator probed to ask what advice the group would provide to the MDHHS based on their impression of the description or sign.

To conclude the group, the coordinator asked each participant to highlight what they thought was the most important point that the research team should take note of when writing this report. After the group was done, the coordinator sent resources provided by the MDHHS to the participants to seek out answers to their questions about HABs and to share with their networks. (See Appendix 4.)

Of the eight focus groups, the largest had eight participants and the smallest had three. The shortest focus group was 1 hour and 20 minutes, the longest was 2 hours and 17 minutes, and the mean length was 1 hour and 53 minutes.

2.4 Qualitative Analysis

Once the focus groups were complete, the recordings were transcribed, deidentified, and uploaded to MaxQDA, a qualitative data analysis software. The transcripts were analyzed using deductive codes that addressed the study's major questions. Examples of key codes include confidence in identifying HABs, source of information, real encounter with HAB, hypothetical encounter/report, real report, non-report, risk tolerance and local conflict. Feedback for each description and sign was coded as like, don't like, confusing, and appropriate context.

After the data was coded, the responses linked to each code were comparatively analyzed for similarities and nuances. To triangulate feedback on the HABs signs, focus group feedback was compared to feedback in the screening survey. The themes were then developed in a series of memos and are summarized in this report.

3.0 FINDINGS

The findings from this study are reported in three parts. Section 3.1 reviews the focus group demographics. Section 3.2 reviews feedback that was collected during the first half of the focus group sessions. This includes how participants search for information on HABs, how they prefer to report HABs, their major questions about HABs, and how they would like the state to communicate about risks associated with HABs. Section 3.3 reviews feedback collected during the second half of the focus group sessions on the MDHHS' descriptions and signs.

3.1 Group Demographics

This study conducted eight focus groups which included 36 total Michiganders. The unit of analysis for this study is at the focus group level. All focus group participants were white, 25 were female, and 11 were male. Table 1 shows how these statistics break down by focus group.

Fifteen participants signed up for a focus group because they or a family member own a second home on a river or lake in Michigan. Some participants owned property on two lakes, some did not own waterfrontage but owned a boat, and others regularly visited beaches. The bodies of water listed for each group in Table 1 correspond with the lakes or rivers where participants had experienced a HAB or, if they had not experienced a HAB, that they visit or recreate on most often. The town where that body of water is located is indicated in parentheses next to the lake or river.

It should be noted that those who chose to participate in a two-hour discussion about HABs were already interested in the issue. Few focus groups had participants with no knowledge of HABs prior to the group. Some participants had seen a HAB on their own lake or researched the issue. Many were on the board or active members in their lake association. Some had taken extension courses at Michigan State or through the Michigan Shoreland Stewards Program.

Four of eight groups had an expert of some kind. In this report an "expert" is someone who has formal training and real-life experience with HABs. Examples of experts in the focus groups include a retired biologist, a high school chemistry teacher, an MSU professor who studies HABs, an employee at a lake management firm, and a retired DNR scientist. Because of their high-level understanding of the causes and policy context of HABs, these experts very likely biased their groups towards a discussion of lake ecology and precautionary measures to prevent HABs. This mix of experts, however, also contributed to a richer discussion on the politics of lake management as they stimulated debates amongst group members over whether waterfront landowners and lake associations are willing to practice preventative measures. The number of experts in each group can be seen in Table 1 in italics under the participants column.

Table 1. Focus group demographics, including the lake or river where the participant recreates most often

Focus Group	Date	Participants (Experts)	Gender		Lake or River and (<i>Location</i>) where the participants live or recreate most often
			Male	Female	
FG 1	3/8/21	4 (0)	0	4	Black Lake (<i>Onaway</i>) Big Bass Lake (<i>Ypsilanti</i>) Huron River (<i>Ypsilanti</i>) Upper Rouge River (<i>unspecified</i>)
FG 2	3/10/21	4 (1)	3	1	Barlow Lake (<i>Middleville</i>) Black Lake (<i>Onaway</i>) Coldwater Lake (<i>Weidman</i>) Emerald Lake (<i>Grand Rapids</i>)
FG 3	3/11/21	3 (2)	2	1	Black Lake (<i>Onaway</i>) Stony Lake (<i>Onaway</i>) White Lake (<i>Pinkney</i>)
FG 4	3/15/21	4 (2)	1	3	Base Line Lake (<i>Pinkney</i>) Cedar Lake (<i>Traverse City</i>) White Lake (<i>Pleasant Lake</i>) Unspecified
FG 5	3/22/21	8 (0)	2	6	Belleville Lake (<i>Belleville</i>) Black Lake (<i>Onaway</i>) – 2 participants Chicagon Lake (<i>Iron River</i>) Coldwater Lake (<i>Weidman</i>) Ford Lake (<i>Ypsilanti</i>) Lake Lansing (<i>Haslett</i>) Lake Missaukee (<i>Lake City</i>)
FG 6	3/23/21	4 (0)	1	3	Black Lake (<i>Onaway</i>) Budd Lake (<i>Harrison</i>) Camp Lake (<i>Sparta</i>) Lake Thirteen (<i>Farwell</i>)
FG 7	3/24/21	4 (1)	1	3	Au Sable Lake (<i>Lupton</i>) Bass Lake (<i>Gowen</i>) Black Lake (<i>Onaway</i>) White Lake (<i>Whitehall</i>)
FG 8	3/35/21	5 (0)	1	4	Black Lake (<i>Onaway</i>) Black Lake (<i>Onaway</i>) Coldwater Lake (<i>Weidman</i>) Coldwater Lake (<i>Weidman</i>) Thompson Lake (<i>Howell</i>)
TOTAL		36 (6)	11	25	23 Michigan lakes and rivers represented

3.2 Feedback on Desired Information about HABs, Reporting, and Educational Outreach

This section reviews the feedback collected during the first half of the focus groups on participants' perceptions and experiences with HABs.

3.2.1 Questions about HABs

Identifying HABs. Each focus group began with the question of how confident each member felt that they could identify a HAB. Almost all those who were not experts in water quality said that they were only a little confident or not at all confident because of their lack of experience with HABs. Those with careers that made them more familiar with HABs, however, expressed some confidence that they could at least tell whether an algal bloom should be tested for cyanobacteria.

When asked what would make people more confident, most groups said that the pictures on the signs they had seen in the screening survey were very helpful because they gave them an idea of what kinds of algal blooms are suspicious. Several groups also decided that a test administer by a citizen or scientist would make them more confident since a HAB cannot be visually identified.

Process of Self-Educating and Reporting HABs. When asked where they would go for information about HABs, there were varied responses. Many said that they would "Google" a question and look for a news article or trusted organization's website. Some said that they found information about HABs on their lake association's Facebook page. When reporting the HAB, however, many residents who felt less confident in identifying HABs preferred to find answers to their questions from a person, not a website. This is because most people did not know how to report a HAB or would prefer someone else do it. Most recounted calling, messaging, or visiting a member of their lake association or a local friend informed about HABs to ask them to report the bloom for them.

Many focus group participants more familiar with HABs said they prefer to reach out to a lake scientist contracted by their lake association, their contacts at environmental organizations like Tip of the Mitt, or research centers like MSU extension. Several participants – especially those who field questions from locals because they sit on their lake association's board – also said that they have reached out to contacts in the DNR, EGLE, MDHHS, and their local health department to receive accurate information. Several, however, said these agencies' efforts to address HABs seemed "disjointed" and that EGLE's website had too much "jargon" in its water quality reports. Instead of going to a state website, these participants almost always referenced names of people they knew in these agencies. Dennis², a lake association member from Black Lake said that his association relies on the state's experts to "stick their necks out" because lake associations are "simply not [seen as] credible sticking their neck out" to provide information on HABs to residents.

² All participant names have been replaced with pseudonyms to protect participants' confidentiality.

"[When I saw the recruitment survey,] my reaction was, 'That's really smart!' I think the health department is a good source for [HABs] information. They're the people I'm going to say the notice is from [when sharing info]. And it's because a lot of people say they don't trust the EPA or they don't trust a lot of organizations. But the health department doesn't speak up that often. And I think it's the right organization to disseminate the message. And I thought that right from the start."

– Dennis, Black Lake

Frequently Asked Questions. Questions about HABs arose organically as groups discussed their experiences. Before responding to these questions, the coordinator asked the group to develop a list of frequently asked questions for themselves and their neighbors. Repeated questions were noted and grouped topically into seven categories of questions. On the next page, Table 2 displays these questions with the most frequently asked question in each topical category in bold.

Table 2. List of questions about HABs developed by focus groups

Type	Questions (<i>Most frequently asked question bolded</i>)
Describing HABs	<p>How can I tell the difference between good algae and a HAB in my lake? What does a HAB look like? What does a HAB smell like? Do HABs kill fish? How long do HABs usually last? Can an algae bloom be "harmful" to the lake if toxic cyanobacteria are not present?</p>
Risk of Exposure	<p>Can I swim in areas of the lake where there isn't a visible HAB? What does "toxic" mean? Is it safe to eat fish in a lake that had a HAB? Is aerosolized cyanobacteria dangerous? Can you swim in or near a HAB? How far away do I have to be to swim safely? Can I drive my pontoon through a HAB? My speedboat? My wave runner? My kayak? How long should I wait after the HAB disappears to swim in the water?</p>
Post-Exposure	<p>What should I do if I was just exposed to a HAB? What symptoms should I look for if I am exposed to a HAB? How long does it take for symptoms to occur and how long do they last? What should I do if I feel sick after being exposed?</p>
Pet Exposure	<p>Can your dog swim in the water? Drink the water? If I catch my dog drinking water from a HAB, should I try to induce vomiting? What should I do if my dog shows signs of illness after exposure to a HAB? What resources are there if my vet doesn't know much about exposure to cyanobacteria?</p>
Testing & Reporting	<p>How do I report a HAB? Does the state test regularly for HABs? If so, where can I check the test results? What happens after I report a HAB? Who do I contact if I have questions about a HAB? Is there a simple test or home testing kit to identify HABs?</p>
Causes of HABs	<p>What is causing the HABs on my lake? Can cyanobacteria move from lake to lake on a boat like invasive species? How do factors like wind, season, water temperature, depth, and rate of flow affect HABs? If you have a HAB on your lake, are you likely to have more HABs? Does treated Eurasian watermilfoil decomposing in lake contribute to HABs? How do seawalls, fertilizers, dog poop, and septic systems contribute to HABs?</p>
Preventing HABs	<p>What short- and long-term strategies can I use to prevent HABs? What can lake associations be doing to educate residents and prevent HABs? Can I prevent HABs by chemically treating the water? How effective is this? Can I prevent HABs by circulating the water? Should I scoop the algae out of the water and try to dispose of it? Are lake management firms contracted by lake associations able to treat HABs? What is the best way to dispose of my pet's waste to prevent HABs?</p>

Major Concerns about Pet Health. Several participants worried, more than anything else, about the health of their dogs who are so accustomed to drinking and swimming in the lake. Several other participants who were more educated about water quality issues, however, claimed that most Michiganders' fears of HABs exposure are disproportionately large in relation to the actual risk of exposure. They expressed a wish for a sentence or paragraph that precedes information about HABs that helps lay citizens contextualize their danger of encountering and being exposed to a HAB in comparison to other environmental risks such as E. coli and invasive species. A few participants said that they believed this disproportionate fear of HABs is linked to the press' coverage of dog deaths that have been suspected to be linked to HABs. Pete, a retired DNR employee, felt most strongly about the issue:

"HABs really became an issue because of the newspapers . . . There was an active HAB [twenty years ago on Tyrone Lake]. A dog died. And of course that hit the newspapers and a dog owner was very upset. But they did an autopsy on the dog and they found out it wasn't the HABs that killed the dog; it was a heart issue that killed the dog. And so there's a lot of that kind of stuff that goes on. And I don't even know if there's been any documented cases of any other dog deaths due to HABs in Michigan since that point. There may have been, but I don't think there has been. So again, HABs is really, really an overblown topic based of the newspapers and sensationalization . . . There's no HABs closing beaches out there, really. But certainly with bacteria issues, there's lots of them and the state doesn't have a septic ordinance statewide. So again, we're putting our emphasis on the wrong things in the state from the lake standpoint . . . You know, there's other things we can be doing for our lakes to really protect them."

- Pete, Retired DNR employee

Nevertheless, several participants were sincerely concerned about whether being exposed to a HAB could have affected their dog's health. One participant, Lauren, has a second home on Au Sable Lake where there have been confirmed cases of HABs on her waterfront. She has not adopted another pet since her dog died last year because she is uncertain whether she can protect her pet from being exposed. She emailed me her story after the focus group:

"I first took [my dog] to a vet in West Branch, MI because she was lethargic the day after drinking water [with a HAB]. [Soon she had diarrhea and] could not jump on the couch or chair without assistance. That vet told me she had arthritis in her spine and gave me an antibiotic for the diarrhea. When we returned home to Oxford, I took her to our regular vet who said she didn't see the arthritis but would treat the diarrhea. She didn't think any of this was due to her drinking the water. She also sent me to a specialist who would not listen to me; she could find nothing wrong because her blood work came back okay. Finally in February I took her to a vet in Traverse City [while] I was visiting my son who told me she had fluid in her abdomen and most likely liver failure or cancer. She was given pain killers and a diuretic. Three weeks later we had to make the hard decision to let her go when she could no longer keep food in (she was also vomiting now). It breaks my heart to this day that they wouldn't listen to me."

- Lauren, Au Sable Lake

The groups' discussions about pets usually concluded with a request that veterinarians have better awareness of the symptoms of cyanobacteria exposure in dogs and education about proper treatment. Otherwise, pet owners may not have a reliable source of information about how to care for their dogs, which could distract from proper education about HABs.

3.2.2 Improving Systems for Reporting HABs

Black Lake is located in Onaway, Michigan near the tip of the Lower Peninsula. The lake is about 10,000 acres and hosts Onaway State Park on its shore. Like many lakes in Michigan, HABs were not a problem on the lake until the last few years. Participants in each group shared a story similar to Tracy's about their surprise and confusion over the sudden appearance of a HAB:

"I've had a place on Black Lake just south of Cheboygan for about 20 years. It's a pretty nice, clean lake. But in last year or two we've had some [harmful] algae blooms. My first experience I was actually in the water playing some games. At first, I thought it was pollen that was in the water. But it turned out it was not. A bloom that was occurring. So it's relatively new up there. I mean, I've owned a place for 20 years and I've never seen it like I did in the last couple of years. So I'm interested in learning more about it and what can be done to prevent it in the future.

- Tracy, Black Lake

Later during the discussion on reporting, nearly every person from Black Lake described the reporting tool that they or a neighbor with a smart phone had used. After HABs became a recurring issue on Black Lake, members of the Black Lake Preservation Society developed an online reporting tool called [Eyes on the Lake](#). Residents who see a HAB on the lake can take a picture, note the location and time of sighting, then a report is automatically sent to EGLE to determine if it is a bloom that needs to be tested. The tool also has functions for reporting invasive species, merganser broods, cases of swimmers itch, and other environmental concerns. Feedback on the tool was overwhelmingly positive, although the groups did express concern in a reporting tool that could only be accessed by those with a smart phone. Furthermore, they explained that while they found the tool helpful, those who are not as concerned about HABs do not know about or use the tool. Carrie and Ellen, who both have cottages on Black Lake, discussed the pros and cons of the tool together:

Carrie: I think the tool is awesome. You can actually report what you've seen. You know, it could be swimmer's itch, it could be harmful algal blooms. Then anyone can go to the interactive map and see one was reported here. It's really helpful, you know, as you're navigating yourself around the lake to see where these blooms are and, you know, are they on one side of the lake? Is it because the winds blow them? I mean, I just find it really helpful that they have that tool so we can see how big of a widespread problem it is and where it's at.

Ellen: The only issue though is not everybody is aware of that tool. And some people are - I don't know how to say this - maybe they don't think it's that big of a deal, or they're not members of the Black Lake Preservation Society, or for whatever reason. So it's not like we all know about it. I would say a small percentage know about it.

Despite concerns, several focus group members asked if there was a way to develop a similar tool for their lake. Others asked if the DNR, EGLE, or MDHHS could develop a similar tool for reporting throughout the state. Every group that discussed Eyes on the Lake concluded by suggesting that the state help lake associations dealing with HABs by developing this kind of reporting tool and by having a HABs reporting hotline.

3.2.3 Local Politics of Lake Management

After the groups had finished discussing their questions about HABs, in every group, participants initiated an organic discussion on the causes and solutions to HABs. Some lamented and others debated about the politicization of water and shoreline management. Many members expressed either during or after the focus group in an email that they appreciated the opportunity to voice their frustrations and to hear that people on other lakes had similar struggles.

"It's tough. It's bloody hard to get people to change their attitudes about their shores."
– Anna, Baseline Lake

"You're fighting a mentality. I mean, in Northern Michigan [the mentality is] "don't tread on me." You know, "I have a right to do whatever I want to do regardless." There are a lot of other factors that come into play [when you're talking about trying to get people to manage their shoreline well]. Being a good steward of the land, you know, it's treading on my rights! [Chuckles]"
– Tracy, Black Lake

Most of these local debates centered around whether the lake association should contract a company to apply chemicals to the lake or whether it should educate lakefront property owners about sustainable shoreline management practices. Almost everyone who joined the focus groups preferred best management practices like creating or maintaining a buffer strip with native plants, not fertilizing their lawns, and maintaining septic systems. Many said that they had been ridiculed online or personally for advocating for planting native plants along the shoreline. Some said their neighbors are afraid that this will make their lake swampy. Steven, an expert in HABs who lives on White Lake, explained his frustration with local marina owners who see chemical treatment as the only solution to HABs:

I've been contacted a couple of times by the marina owners. And of course they want to know, well what do we to get rid of it? . . . And they don't really want to hear about the excess nutrients that are coming down the White River and the White Lake and returning it to a eutrophic state than it hasn't actually been in for, you know, maybe 20 years or so . . . Everybody is looking for a quick fix. They've got three months to make a year's worth of livelihood and they don't want anything interfering with it. And if something does, they want to take care of it. The people who come along from the lake management community have their range of tools. You know, it's the old, "If all you got is a hammer, then everything becomes a nail."
– Steven, White Lake

Participants described another major issue: once people begin learning about the causes of HABs, they often want to point fingers at other stakeholders on their lake or in their watershed instead of accepting some responsibility for the issue as a lakefront landowner and doing what they can on their own property. In Nia's case on White Lake (Pleasant Lake, MI), those who had lived on the lake for longer blamed newcomers who are building lakefront mansions with lawns up to the shoreline. On Black Lake, participants blame the UAW golf course on the lake. On White Lake (Whitehall, MI), residents blame upstream celery farms for overfertilizing. Lauren from Au Sable Lake explains how those who do not commonly have HABs on their own waterfrontage can deflect responsibility as well:

"The problem with my lake is [that] we have like three or four different associations. And a lot of them want to say, well, it's not in front of my house, so it's not my problem . . . [My family] has got a little cove here and [the HAB] just blows right in from the lake. So a lot of other people don't have it in front of their cottage and then they don't see it. So out of sight, out of mind."

– Lauren, Au Sable Lake

The groups agreed that the shoreline is a highly contested space where waterfront landowners can exercise their own preference for water and land management practices. Ultimately, the groups decided that individuals' perceptions of the causes of HABs and potential solutions are strongly influenced by aspects of their personal identity. Participants cited education, political position, past experiences with HABs, tolerance for risk, location on the lake, and their position in the watershed as some of the key factors that influence how they perceive HABs.

3.2.4. Feedback on MDHHS' CyanoHABs Outreach

After about an hour of discussion of participants' experiences with HABs, the focus group coordinator began asking for feedback on the MDHHS' outreach materials, including three descriptions and three signs. While collecting feedback on these materials, participants posed questions about the state's responsibility to educate the public about environmental health risks, whether signs are the best means of educating the public, and how HABs awareness can be framed within a discussion of lake conservation.

State vs. Individual Responsibility for Assessing Risks. Several focus groups questioned whether a sign was the appropriate way to inform the public about HABs. Several compared the issue to E. coli in the water and were confused why the state would close beaches for E. coli but only post a sign for a HAB. Participants were concerned that this placed too much responsibility on lay people to assess the risk of getting into a lake with algae, especially since it is nearly impossible for a lay person to know if there is cyanobacteria in the water based on visuals alone.

Sign Fatigue. Most focus groups expressed concern that most visitors at a boat launch or beach would ignore the sign because it would blend in with other signs such as invasive species signs, which they said many already ignored. They offered two solutions:

- **Colored Flag or Sign System:** Participants suggested that local authorities or a lake association member could put up a red, yellow, or green sign or flag, like those used for riptides and forest

fires, to indicate the level of danger that day at local beaches, marinas, and boat launches. Many participants, however, noted that an up-to-date flag system would probably require too much work on the part of the state to regularly test water and change signs accordingly.

- Digital Signs and Postcards: Most focus groups suggested that the signs be made available as a PDF on the MDHHS' website so that they could be downloaded and shared in lake associations' Facebook groups. They also suggested that the signs be made into a postcard that could be mailed to those who live on a waterfront property who may not visit a public water access site. These postcards could also be handed out when people purchase their fishing licenses and at boat livery in towns with a history of HABs as well.

Proactive Education about Conserving Lake Ecosystems. Many people participated in the focus groups because they were interested in their lake's ecosystem. HABs experts, in particular, expressed concern that these signs only react to a health problem. Other group members confirmed these concerns. Nearly every group said that these signs must be complemented with proactive educational outreach. Outreach should address the following points:

- Although HABs happen more frequently due to climate change, they are still relatively rare.
- In most cases algae is not dangerous but indicative of a healthy lake ecosystem.
- Algae should not be chemically treated but prevented through the use of best management practices by waterfront property owners, such as maintaining one's septic system and not fertilizing a lawn.

3.3 Feedback on MDHHS' Educational Materials

3.3.1 Feedback on Descriptions

After the group had finished their discussion about their experiences with HABs, the focus group coordinator transitioned to collecting feedback on the three descriptions of HABs. The descriptions written by the MDHHS were shown to participants in their numbered order here. First the coordinator asked for the group's impression of a description. After the whole group or part of the group reached a consensus on an impression, the coordinator asked the participants what they thought the MDHHS should do to improve the sign based on that feedback. Impressions are noted under the "comments" column and the corresponding advice is listed in the "suggestions" column for each description in Table 3.

Description 1: Not all algal blooms contain toxins, but it is difficult to tell by looking at a bloom if it is harmful. Also, the amount of toxins in a bloom can change over time. HABs can be a variety of colors such as blue, green, blue-green, brown, white, purple, or red. HABs can look like scums in the water that may have small flecks, foams, or globs and mats floating in it. The water can also look like it has spilled paint or a green sheen on the surface. When in doubt, keep yourself and pets

Description 2: People and pets should avoid direct body contact with scummy water in the lake, water that looks like spilled paint, or water with a green or blue-green sheen to it.

Description 3: People and pets should avoid direct body contact with algal scums in the lake, water that looks like it has a green sheen or spilled paint on its surface, or water that looks like pea soup. People and pets should also avoid swallowing the lake water. To help identify a HAB, visit the [HAB Picture Guide](http://www.michigan.gov/habs) at www.michigan.gov/habs for examples of HABs and other lake conditions mistaken for HABs.

Table 3. Feedback on descriptions of HABs

Feedback	Description	Comments	Suggestions
Positive	Description 1	First sentence is informational without being frightening	- Consider using this as the first sentence in the final draft of your HABs description
	Description 3	Preferred description across groups	- When editing, begin with this version and edit
		Appropriate tone	- Continue using this non-frightening, educational tone
		Link to pictures	- Put this link into all the descriptions
Negative	All 3	Vague descriptions of algae	- Remove vague descriptors, especially common algae colors like "blue" or "green" - Include pictures
		H.A.B. vs. Harmful Algal Bloom	- Write out "harmful algal bloom" before using the acronym HAB
		Missing logo	- Add the MDHHS logo for credibility
		No healthy algae pictures	- Consider adding side-by-side pictures of healthy algae
		"Scum" and "Scummy"	- You could probably remove this word to lessen confusion
		Reporting HABs	- Include contact info for reporting or learning more
	Description 1	Too much text	- Consider bullet points - Add a link to visuals
	Description 2	Too succinct	- At least add a link to where people can find out more
	Description 3	Last sentence is confusing	- Consider splitting into two sentences or wordsmithing so that it is clearer

3.3.2 Feedback on Signs

After the groups finished giving feedback on the descriptions, they provided feedback on the HABs signs. All of the focus group participants had at least seen the “Warning” sign during the recruitment survey and most had seen all three. The feedback from the short-answer responses in the surveys included responses from 36 focus group participants as well as 99 other survey respondents who did not sign up for a focus group. After analyzing focus group feedback on the signs, this feedback was compared to responses from the survey to check for any conflicting or new advice. The survey responses confirmed the findings from the focus group. These responses are available in Appendix 5.

Similar to the responses on the descriptions, feedback on the signs is available in Table 4. While providing impressions and suggestions, respondents began to ask what the context of these signs would be. They asked if they would be permanent, only posted at lakes with past HABs, only at lakes with active HABs, etc. In response, the focus group coordinator asked for feedback on where the participants thought the signs would be appropriate. These responses are summarized in Table 5.



Sign 1



Sign 2



Sign 3

Table 4. Positive and negative feedback and suggestions for signs

Feedback	Sign	Comments	Suggestions
Positive	All	Pictures are helpful	Keep pictures, but see negative feedback below on picture 3
		Circular graphics are eye-catching	Keep the circle graphics
		MDHHS logo builds credibility	Keep the logo
		Website link is	Keep the website and make sure that it's ready for curious visitors
	2	Allows for informed instead of fearful decision	Try to use an educational rather than scary tone that provides readers with the information necessary to assess their risk
Negative	All	Third picture is unclear	Find an alternative picture
		Descriptions of HABs are confusing	Label the pictures with the descriptor words that they depict, i.e. pea soup
		No info on how to report	Include a line about how to report that perhaps has a QR code
		Makes all algae seem bad	Include a sentence about healthy algae or a link/QR code with pictures of good algae
		Leaves reader with more questions than answers	The brief descriptions are appropriate for a sign but address the FAQs on the website
		Confused about why HABs now happening	Consider explaining why HABs are becoming a bigger issue in Michigan in the FAQs
		The rinsing off graphic is confusing	Remove or clarify that rinsing off is not a substitute for avoiding all contact with HABs
	1	"This sign will make my neighbors want someone to fix the lake."	Be prepared for political pushback as a result of increased perceived risk
	3	So positive that people may not look at pictures	Consider putting the pictures of HABs before the graphic circles for only this sign

Table 5. Suggestions on the context for HABs signs

Sign	Comments	Suggestions
1	This sign is "an immediate nope [to getting in the water]", "scary", "kinda terrifying", "borders on sensationalism", and "not my preferred" sign in most cases. Too much red and "don't" for most contexts.	<ul style="list-style-type: none"> - This sign should only be used when there is or has recently been an active HAB and you are trying to keep people out of the water - The warning should be dated or time-stamped in case the sign is left longer than the active HAB
2	I like that it says "may contain". This sign is less intimidating.	<ul style="list-style-type: none"> - This sign could be used in places without active blooms - The sign could be left up year-round, but only near water that has had a HAB - If you are trying to communicate urgency, this sign is better than no. 3
3	This sign is more educational, less threatening, and has a positive spin.	<ul style="list-style-type: none"> - This sign should not be used in contexts where people need to stay out of the water - This sign could be posted year-round, shared as a picture on Facebook pages, sent as a mailer to waterfront landowners, and distributed with fishing licenses

Appendix 1: Recruitment Survey

Start of Block: Pre-Screening Block

Thank you for your interest in our research!

Before we continue, we are required to inform you of a couple things.

We are requesting that you fill out this survey to determine whether you are eligible to participate in a focus group on harmful algal blooms in Michigan. We have sent you this survey because you indicated in a previous survey that you would be interested in participating in a follow-up focus group.

This survey will elicit some basic baseline information about you so that we can determine whether you're eligible to join a focus group.

This survey is voluntary but you must complete it to be considered for a focus group. You may decide not to participate and elect to leave the survey at any point without penalty.

Your responses will be confidential and will not be reported in any way that would permit them to be connected to you personally.

This survey will take about 15 minutes of your time. There is no direct compensation for this survey, but you will be offered a \$50 incentive to thank you for your time if you attend an online focus group.

There are no known risks to completing this survey, but if you have concerns or questions about this study, please contact the researcher, Alaina Bur, via email at buralain@msu.edu. You may also contact the project's faculty supervisor, Dr. Joseph Hamm, at jhamm@msu.edu.

If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, the Michigan State University's Human Research Protection Program at 517-355-2180, Fax 517-432-4503, or e-mail irb@msu.edu or regular mail at 4000 Collins Rd, Suite 136, Lansing, MI 48910.

Thank you for your interest in this study. We would like to ask you some questions to determine whether you are eligible to join a focus group.

Are you 18 years of age or older?

Yes

No

Do you live on a lake or river in Michigan?

Yes

No

Do you recreate on a lake or river in Michigan?

Yes

No

End of Block: Pre-Screening Block

Start of Block: Ineligible End of Survey

Thank you for your interest in this research. Unfortunately, you do not meet the eligibility requirements to participate in a focus group.

To read more about how to identify a harmful algal bloom, you can visit the [Department of Energy, Great Lakes, and Environment's website](#).

End of Block: Ineligible End of Survey

Start of Block: Warning Sign Block

Now we would like to hear your thoughts about a sign that may be used to share information about harmful algal blooms in Michigan. Please review this sign and answer the following questions.

[WARNING SIGN HERE]

What do you like about this sign?

Is there anything confusing about this sign? Please explain.

If you noticed this sign posted near a lake or river that you regularly visit, what would you do?

The required portion of this survey is now complete. If you are willing though, we would like to ask you for feedback on another sign.

- Yes, I'm willing to continue
- No, I'd like to sign up for a focus group now

End of Block: Warning Sign Block

Start of Block: Focus Group Consent Block

You are eligible to participate in a focus group about harmful algal blooms. If you participate, you will receive a \$50 incentive to thank you for your time. We need your consent if you would like to sign up. Please note that this consent form is slightly different than the first one in this survey because it is specifically for joining in a focus group.

Research Participant Information and Consent Form

We are requesting your participation in a focus group with up to ten other Michiganders about harmful algal blooms. The focus group will take about two hours. Your participation in the focus group is voluntary and you may decide not to participate and leave the online discussion at any time without penalty.

The focus group will be recorded and securely saved. Your responses will be confidential and will not be reported in any way that would permit them to be connected to you personally.

We ask that all focus group participants respect the confidentiality and privacy of other participants by not sharing anything that is said in the group after the discussion ends. Because of the nature of focus groups, however, the research team cannot guarantee that information you share in the discussion will not later be shared by another participant. There are no other known risks to participating in this study, but please contact the research team if you do experience complications.

You will be provided with a \$50 incentive to thank you for your time.

If you have questions or concerns about this study, please contact the researcher, Alaina Bur, via email at buralain@msu.edu. You may also contact the project's faculty supervisor, Dr. Joseph Hamm, at jhamm@msu.edu.

If you have questions or concerns about your role and rights as a research participant, would like to obtain information or offer input, or would like to register a complaint about this study, you may contact, anonymously if you wish, the Michigan State University's Human Research Protection Program by phone at 517-355-2180, by fax at 517-432-4503, by e-mail at irb@msu.edu, or by mail at 4000 Collins Rd, Suite 136, Lansing, MI 48910.

I have read the Research Participant Information and Consent Form and voluntarily agree to participate in this study. I also agree to be video and audio-recorded in an online focus group.

- Yes, I consent. (Please enter your name.) _____
- No, I do not consent

End of Block: Focus Group Consent Block

Start of Block: Eligible End of Survey

Please [click to sign up for a focus group](#). [Link to Calendly.] You will be redirected to our scheduling website. After you have signed up for a focus group, you will have completed this survey.

End of Block: Eligible End of Survey

Start of Block: Awareness Sign Block

Please evaluate the following sign and respond to the questions below.

[ALGAE AWARENESS SIGN HERE]

What do you like about this sign? Why?

Is there anything confusing about this sign? Please explain.

If you noticed this sign posted near a lake or river that you regularly visit, what would you do?

Are you willing to provide feedback on the third and final sign?

- Yes, I'm willing to continue
- No, I'd like to sign up for a focus group now

End of Block: Awareness Sign Block

Start of Block: Danger Sign Block

Please evaluate the following sign and respond to the questions below.

[DANGER SIGN HERE]

What do you like about this sign? Why?

Is there anything confusing about this sign? Please explain.

If you noticed this sign posted near a lake or river that you regularly visit, what would you do?

End of Block: Danger Sign Block

Appendix 2: CyanoHABs Focus Group Guide

Introduction [10 minutes]

Before we get started:

- **If your internet cuts out**, try to reconnect. If you can't reconnect after five minutes, you can rejoin the Zoom call by calling into the phone number I sent you in the Zoom invite.
- **Try to leave yourself unmuted** so that you can speak when you want. The mute button is in the bottom left hand corner.

Review consent form:

- **The focus group should take two hours today.** Although we've designed the discussion with the hopes that you will all stay for the two hours, you can decide to leave the focus group at any time without any kind of penalty.
- Just as a reminder, **I am recording our Zoom meeting**, but I just use that to create a transcript. When we type up a transcript, our research team will remove any identifying information so that your name won't be linked to what you say.
- Because of this, we are asking that you **not share anything** that's said in this group after the discussion ends to protect other participants' confidentiality. But with that said, know that we can't guarantee that information that you share here won't be shared by other participants.
- Finally, you'll be receiving **\$50 to thank you** for your time. The lead on the project, Joe Hamm, will be emailing you a link to receive the \$50. You'll receive the money as a digital Visa gift card or. If you prefer, you can also choose to receive a physical Visa gift card by mail, but this option will deduct a \$3 fee.
- **Any questions** before we get started?

So today I'd like to have a conversation about harmful algal blooms (HABs) on Michigan lakes and rivers. All of you have been invited to this focus group because you live on or regularly visit a lake or river in Michigan. Some of you may have had experiences with HABs and some of you may not, which is great – we are looking for a variety of experiences. So we'll start off just talking about your perspective on HABs and how you would react to them. Then, later on we'll revisit one of those signs that you saw in the survey.

My name is Alaina Bur. I'm a PhD student in the Department of Sociology at Michigan State University. And I'm a research assistant on this project that's lead by Dr. Joe Hamm in Environmental Science and Policy Program at MSU. I was born and raised in Michigan. I grew up visiting my family's little cottage up on Hubbard Lake during the summers and it is my favorite place in the word. So water quality in Michigan is a topic that is near and dear to my heart.

Identifying HABs [30 minutes]

So, to start, I'll have everyone briefly introduce themselves very. If you feel comfortable, just share your first name and the body of water that you visit most often in Michigan.

Identification of HABs: How confident do you feel that you could identify a HAB if you saw one?

- Probe: What would make you more confident?

Information Source: If you weren't very sure whether an algal bloom is harmful or not, what would you do to find out?

- Examples: Ask a friend? / Look it up online? / Look for signs posted in the area?

Awareness of HABs: How often do you check to see if a lake or river has signs of a HAB?

Description of HABs: For those of you who have seen HABs before, how would you describe their appearance?

- Probe: If a friend were to call you up on the phone and ask you if the algae they saw was harmful, what words would you use to describe a HAB?

Reacting to and Reporting HABs [30 minutes]

Reaction to HABs: Now imagine that after this meeting you go out to the lake or river you usually visit and do see an algal bloom that looks like it might be harmful.

- What would you do?
- How would that change if you were going for a walk with your dog, boating, or swimming?

Reporting HABs: Have any of you ever thought about reporting a HAB before?

- What happened?
- If no: What kept you from reporting it?
- If yes: Would you report another HAB if you saw one again? Why or why not?
- What do you think the main obstacles are to reporting HABs?

Information Gaps: What questions do you have about HABs?

- Probe: If we were to make a list of the Frequently Asked Questions about HABs, what questions do you think would go on it?
- Examples: What does a HAB look like? / How can I be exposed? / What are the effects on human health/pet's health/wildlife? / What can I do to make the HAB go away?

MDHHS Description Review [20 minutes]

Now I want to get your feedback on three descriptions that the MDHHS has written to describe HABs to Michigan residents.

Put descriptions up on the screen one by one

Read: Not all algal blooms contain toxins, but it is difficult to tell by looking at a bloom if it is harmful. Also, the amount of toxins in a bloom can change over time. HABs can be a variety of colors such as blue, green, blue-green, brown, white, purple, or red. HABs can look like scums in the water that may have small flecks, foams, or globs and mats floating in it. The water can also look like it has spilled paint or a green sheen on the surface. When in doubt, keep yourself and pets out.

- What do you think of this description?
- Is there anything confusing about this description?

Read: People and pets should avoid direct body contact with scummy water in the lake, water that looks like spilled paint, or water with a green or blue-green sheen to it.

- How does this description compare to the last one?
- Is there anything confusing about this description?

Read: People and pets should avoid direct body contact with algal scums in the lake, water that looks like it has a green sheen or spilled paint on its surface, or water that looks like pea soup. People and pets should also avoid swallowing the lake water. To help identify a HAB, visit the [HAB Picture Guide](#) at www.michigan.gov/habs for examples of HABs and other lake conditions mistaken for HABs.

- How does this description compare to the other two?
- Is there anything confusing about this description?

MDHHS HAB Warning Sign Review [15 minutes]

Now I would like to get your feedback on a sign that the MDHHS has designed to post at sites that may have HABs. You should have seen this sign in the survey you took before this focus group.

Post (1) Danger, then (2) Warning, then (3) Algae Awareness Sign on the screen in Zoom and collect feedback on each sign.

- What are your initial thoughts when you see the sign?
- Is there anything confusing about the sign?
- If you were on a walk by a lake and saw this sign, what would you do? Why?
 - Would you read the sign? Why?
 - Would you check the water for signs of a HAB? Why?
 - Would you follow the directions on the sign? Why?
- Is there anything else you think MDHHS could do to improve this sign?

Wrap-Up [15 minutes]

To wrap up, when I'm writing up a report of our discussion today, what is one important point that I should pay attention to? It can be something that we have talked about today or that we have not discussed yet.

Appendix 3: Focus Group Slides

Description 1

Not all algal blooms contain toxins, but it is difficult to tell by looking at a bloom if it is harmful. Also, the amount of toxins in a bloom can change over time. HABs can be a variety of colors such as blue, green, blue-green, brown, white, purple, or red. HABs can look like scums in the water that may have small flecks, foams, or globs and mats floating in it. The water can also look like it has spilled paint or a green sheen on the surface. When in doubt, keep yourself and pets out.

Description 2

People and pets should avoid direct body contact with scummy water in the lake, water that looks like spilled paint, or water with a green or blue-green sheen to it.

Description 3

People and pets should avoid direct body contact with algal scums in the lake, water that looks like it has a green sheen or spilled paint on its surface, or water that looks like pea soup. People and pets should also avoid swallowing the lake water. To help identify a HAB, visit the [HAB Picture Guide](http://www.michigan.gov/habs) at www.michigan.gov/habs for examples of HABs and other lake conditions mistaken for HABs.

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.	Rinse people and pets off after any water contact.

Harmful algal blooms look like: spilled paint, pea soup, floating scums, mats, sheens, clumps, or streaks

				
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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



WARNING

This water may contain harmful algal blooms:



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.



Rinse people and 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



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.



Rinse people off after any water contact.



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



Resources from MDHHS on Harmful Algal Bloom

Contact Information

Alaina Bur, Focus Group Leader
Michigan State University
buralain@msu.edu

Joe Hamm, Project Lead
Michigan State University
jhamm@msu.edu

Alexandra Rafalski, PhD Toxicologist
Dept. of Health and Human Services (DHHS)
rafalskia@michigan.gov
517-881-1046

General HABs Information

- [State of Michigan and MDHHS Press Release](#)
- **State of Michigan Website on HABs:** www.michigan.gov/habs
 - Includes FAQs
 - See the “Reports” section near the bottom of the webpage for information on tracking HABs

How to Identify a HAB and Have it Tested for Toxins

- **Report** suspicious-looking algae by e-mailing EGLE at AlgaeBloom@michigan.gov with picture(s) of the algae. In response to reports of likely cyanobacteria (based on pictures or description), when possible, EGLE will collect water samples in public waterbodies for testing to determine if cyanotoxins present.
- The [Harmful Algal Bloom Picture Guide](#) contains examples of HABs and compare to other algae and plants found in lakes.
- [Simple, no-cost tests for blue-green algae](#) usually work to identify cyanobacteria (the organism that causes HABs) from non-harmful algae. It is recommended to consult the picture guide and/or email pictures to EGLE. If using these tests, follow the recommended precautions, and when in doubt, stay out.

EGLE’s Recommended Resources on Causes & Prevention of HABS

- [Septic System Education from MSU Extension](#)
- [Video Series on Understanding Algae Blooms](#)
- [How to Create and Maintain a Beautiful and Healthy Waterfront](#)
- [Algal Blooms, Scums and Mats in Ponds](#)
- [Michigan Shoreland Stewards Video Series](#)

Appendix 5. Harmful Algal Bloom Focus Group Screening Survey Responses

	A	B	C	D	E	F	G	H	I	J	K
1	Demographics		Warning Sign			Algae Awareness			Danger Sign		
2	Live on lake or river in MI	Recreate on a lake or river in MI	What do you like about this sign?	Is there anything confusing about this sign? Please explain.	If you noticed this sign posted near a lake or river that you regularly visit, what would you do?	What do you like about this sign? Why?	Is there anything confusing about this sign? Please explain.	If you noticed this sign posted near a lake or river that you regularly visit, what would you do?	What do you like about this sign?	Is there anything confusing about this sign? Please explain.	If you noticed this sign posted near a lake or river that you regularly visit, what would you do?
3	Yes	Yes	Warning sign	not at all	Conscious of the sign	Warning sign	no	conscious of the sign	Warning sign	no	conscious of the sign
4	Yes	Yes	Accurate if algae blooms are occurring.	No	Stay out of the water.	It makes people aware that algae blooms are toxic.	No	Find out what is being done to prevent too many nutrients from entering the water.	Warning of the danger of toxins.	No	Stay out of the the water.
5	Yes	Yes	I love the sign because it is very Informative and understandable	I don't think the sign is confusing	I would take time to read and interpret it meaning at the same time obey it caution	The sign is attractive and understandable	I think the images are little bit confusing	I would definitely read and follow it Instructions for a safety	Very Informative sign	Nothing confusing actually	Would read definitely and follow it Instructions
6	No	Yes	Very clear instructions and images allowing people to identify and steer clear of HABs.	No.	Inspect the shore and areas nearby for the indicated evidence of HABs and stay out of the water if I found there were any.	This one encourages people and their animals to enjoy the water if there is not evidence of HABs.	No.	Check for HABs before entering the water.	Very clear messaging regarding the danger of HABs.	No.	Stay out of the water.
7	No	Yes	Pictures of different varieties so people know what is harmful. Clear directions on what not to	No	I would check the water to be sure it was clear and safe to use.	It has a more positive perspective than the first by telling you what you are also allowed to do.	If people could not read, the visuals might indicate that it is okay to swim if you rinse off.	Check the water for algae to see if it's safe to use.	Very clear about what you shouldn't do, including rinsing off people and pets if exposed.	No	Check the water for algae to determine if it's safe to use.
8	Yes	Yes	It is very informative and very easy to understand	Nothing	I would abstain from touch or recreating on the lake	This sign is very captivating because it is precise and easy to comprehend	Nothing	I would avoid such lake and also create awareness for people around me	This sign is well designed and informative	Nothing	I would avoid such lake and encourage others to do the same
9	No	Yes	The graphics	It may be beneficial to describe potential harm that could occur from coming in contact with the substance.	I would be very leery about swimming in the lake.	I like how this sign has a more positive spin. It encourages people to use the lake with caution.	No	Be on the lookout for algae blooms, but feel like I could still enjoy the water.	This sign is more aggressive and provides a stern warning.	No	I would not use the lake or river for fear of getting sick.
10	Yes	Yes	The info that tells you what a harmful algae bloom looks like.	Where it says not to boat, jet ski or fish in Algae blooms. Our lake does it a few times a year and I don't think we have the harmful algae.	Look at the water and decide.	A little less gloomy than the other one.	Yes. Is all algae harmful? I never considered it on our lake. First bloom comes when it's still too cold to swim.	Find out if it's harmful algae and decide if I am going to use the water.	This clarifies that the harmful algae is present.	Does every algae bloom contain harmful algae in the tested water?	Stop going there
11	Yes	Yes	They are helpful	There is nothing confusing about this sign	I would obey the sign	They are helpful	There is nothing confusing about this sign	I would obey it	They are helpful	There is nothing confusing about the sign	I would obey the sign
12	Yes	Yes	Informative. Photos showing HAB's. Pics showing when and who should avoid the lake	No	More aware of the potential for illness related to the water	Gives you caution.	No	Investigate the lake. Look for HAB. Look for other people recreating on this lake	The Ted color signals danger. My first thought.	No	I would not allow myself, children or pets into this body of water
13	Yes	Yes	Do not swim near algal blooms Do not let pet swim or drink algal water & Do not touch water or shoreline with algal blooms	Not at all	Decease form there as soon as i see it	All the signs are self explanatory. It tells what to do and what not to do with some photos to explain it	None	Take note of all the signs I just saw and put it to test	The signs that shows that algal blooms are harmful and a way to scale through it.	Nothing is confusing at all	I'll make sure i stay away (refrain) from such places
14	Yes	Yes	The sign that show what organisms it is harmful to	Not really	Watch for algae	The pictures	The green versus the red	Be careful and look for algae	The red lines through the pictures	All the red , it drowns out the one green thing	Be afraid
15	Yes	Yes	Very informative. The pictures are also very helpful.	None	Read it and do a little more research on the topic. Never really thought about this or been concerned about it before.	Same as first sign	None	Do further research to ascertain whether or not the lake is safe to swim in	The red lettering sticks out more and makes the sign seem like it is more of a serious warning and not just a "suggestion"	None	Probably be more likely to take the sign seriously and then do more independent research

	A	B	C	D	E	F	G	H	I	J	K
1	Demographics		Warning Sign			Algae Awareness			Danger Sign		
2	Live on lake or river in MI	Recreate on a lake or river in MI	What do you like about this sign?	Is there anything confusing about this sign? Please explain.	If you noticed this sign posted near a lake or river that you regularly visit, what would you do?	What do you like about this sign? Why?	Is there anything confusing about this sign? Please explain.	If you noticed this sign posted near a lake or river that you regularly visit, what would you do?	What do you like about this sign?	Is there anything confusing about this sign? Please explain.	If you noticed this sign posted near a lake or river that you regularly visit, what would you do?
16	Yes	Yes	it's pretty inclusive in regard to what should not be done in water with algae blooms	I don't think the jet ski is as intuitive as it could be for non-English speaking people. A picture of a more obvious boat would be better. The algae blooms look too "pretty"... like nice little waves. Perhaps they should look more ominous.	Leave that lake	I like that there are pictures and a written description of algae.	perhaps consider adding the algae "symbol" (green waves) to the real pictures with algae blooms.	think twice about using that body of water for recreation	The red in the sign makes it obvious that this is a high alert sign	You warn against entering the water, but then indicate that you should rinse off if you have contact with the water. It almost gives passive permission to use the water with the caveat that you need to shower afterward.	leave
17	No	Yes	Very informative as to what a bloom looks like	No	Inform friends and neighbors	Still as informative as the previous sign	The dark coloring doesn't draw attention to the information	May or may not read...coloring doesn't draw my attention	The red draws my attention more than the green sign	Not confusing but I would be more inclined not to get into the water or would feel less safe with the red signage as opposed to the yellow (which would give me more caution) or the green (which I probably wouldn't notice)	Look for somewhere else to swim fish or boat
18	No	Yes	I could read it and understand it quickly. I know what to look for and how to respond.	The pictures look so different from each other that I may see something that is not an HAB and be alarmed	look at the water before I proceeded with whatever I was doing.	I think this one is less urgent. I don't feel threatened when I read it, but I don't take it as seriously.	no	I would probably continue to go about whatever I was doing	the red does cause you to stop and read it.	no	stop and read the sign and think about whether I should go in the water.
19	Yes	Yes	Photos are accurate	Nothing	Not go in the water or let my dogs swim	Understanding is very clear	Nothing	Make sure there was no harmful algae before getting in the water	The red color warns of danger	Nothing	Leave
20	Yes	Yes	I like the pictured based explanation of restrictions and the use of multi-colors to make it more eye catching.	The photographs are small and hard to distinguish in detail what is trying to be pointed out.	Probably read enough of it the first time to understand what it is trying to communicate, than just a cursory notice of it beyond that.	Same as the prior example, the use of pictographs to communicate the restrictions (and uses which are acceptable) and multi-color use.	Again, the photographs. Especially the third from the left.	I would take note.	The red color exhibits a need to look to see what the hazards are.	The green pictograph seems to get lost in the warnings	The red color I guess would draw your eye more than a more natural color.
21	Yes	Yes	It is clear. It has pictures of what to avoid. It offers a site for more information.	The phrase 'mats, sheens, clumps or streaks' seems to be too general.	Be more cautious about swimming ...perhaps assume that harmful algal blooms had been found in that lake.	It is clear. It has images that give examples of HABs. It tells me a site for additional information.	The combination of information about areas without HABs and with HABs puts too much info on the sign. Is it really true that HABs are only green?	Assume there have been HABs in this lake. Be more fearful about swimming.	The red clearly calls attention to the danger.	Without information about dates and specific locations on the lake, it seems like this is a constant and pervasive HAB. A sign like this would need updating, perhaps an outline of the lake with an indicator as to where the HAB occurred.	Feel sad and not swim. I think the sign needs some indication about what is being done about the HABs that have been found.

Appendix 5. Harmful Algal Bloom Focus Group Screening Survey Responses

	A	B	C	D	E	F	G	H	I	J	K
1	Demographics		Warning Sign			Algae Awareness			Danger Sign		
2	Live on lake or river in MI	Recreate on a lake or river in MI	What do you like about this sign?	Is there anything confusing about this sign? Please explain.	If you noticed this sign posted near a lake or river that you regularly visit, what would you do?	What do you like about this sign? Why?	Is there anything confusing about this sign? Please explain.	If you noticed this sign posted near a lake or river that you regularly visit, what would you do?	What do you like about this sign?	Is there anything confusing about this sign? Please explain.	If you noticed this sign posted near a lake or river that you regularly visit, what would you do?
22	Yes	Yes	That it warns people not to swim in toxic water	Too much information on one sign. There are too many pictures, the pictures are too small. Yellow background with black lettering is harder to read than a red & white or blue and white. People would be less likely to notice it for those reasons	Read some of it, but if you are excited about getting on the water you won't take the time to read everything or walk up to it to take a close look at the pictures.	The colors are much better, it is a lot more noticeable than yellow and black.	The pictures are still too small and some seem to be zoomed in too close to the water.	Yes, it would be less time consuming to read, maybe place two signs, one by the dock/water and one facing the water where a driver backing a boat down the ramp would see it.	The jet ski picture is more helpful to boater and PWC owners.	Pictures too small and too many pictures of algae. The pictures should be zoomed out to show a larger area of water because if the algae isn't as thick in some areas people may think it's safe for those reasons, even when it really isn't.	Read the top part, but not the words above the algae pictures. The font size is too small for me to think that it's as important.
23	No	Yes	It is very easy to follow and understand. The images also help a lot on what the algal blooms look like	No, it is very clear on what to avoid	If I saw a sign like this I would immediately leave and try to find another lake to enjoy my time on	The images definitely help make it easy for people to identify what is a harmful algal bloom	No, nothing is confusing about it, it is very clear	I would take a picture of the sign just in case I need to look it up for reference and be a little more cautious when on the water	The images again, and the red definitely stands out against the images. It immediately caught my attention in	No nothing is confusing about it	I would leave and go somewhere else to enjoy the lake as I would not want to risk anything
24	Yes	Yes	I like symbol	The diagrams	Very good	The signs	The diagram	Very good	The design	The structure	Very good
25	No	Yes	Coverage	It's OK	Heed it	Coverage	It's OK	Heed it	The coverage	It's OK	Heed it
26	Yes	Yes	The warning pics are great but the pics with actual life examples are very helpful.	No	Study it then watch for blooms.	Warning signs	No	Study pics & watch out for blooms.	The color - very attention getting	No	Probably not go in. For sure I wouldn't let children or pets go in.
27	No	Yes	It is clear and has detailed pictures of the algal blooms.	No.	Depending on the form of recreation I may choose to not visit that lake or river. At the very least I would know to take extra precautions.	The title is catchy and the colors pop.	No.	Either not recreate on that body of water or take extra precautions.	The bright red color emphasizes the word "danger" when describing the algal blooms.	No.	Not recreate on that body of water.
28	Yes	Yes	The pictures with examples	The examples are very small	Check for signs of algae in the water	Examples and the dos/donts	Not really	Check for signs of algae bloom	That the dangers are clearly displayed	Need clearer examples of types	Check for algae bloom and stay out of the water
29	Yes	Yes	The photos	No	Stay out of it.	The diagrams. They clearly show and state what you should and shouldn't do if you're near a questionable body of water.	Small print under pictures may cause people to skip over reading it.	Not go in the water. Look for cleaner area.	States that blooms have been there in the past.	No	Go elsewhere.
30	Yes	Yes	I can relate to it from experience; but, for the "man on the street", it may be too complex. Just one caveat at a time is about all the general public can assimilate.	Too many warnings.	Walk on by!	Same as previous response. Too busy!	Too many issues. Just put on a QR Code that the passerby can scan for details. Keep the message simple.	Walk on by.	Same same!	Overly instructive. Use a QR Code!	Look for a QR Code! Everyone used them now to order food from a restaurant!
31	Yes	Yes	"WARNING" On top of posting good attention grabber.	Not to me	Stay clear of the Algae. I think most people would continue to swim if they didn't see the Algae.	I think the message is clear.	Only as it relates to the other sign. Independently the signs are good.	Look for Algae	Same as the other two, I think the message is clear, but not as clear as the other two.	Yes - it does not give options of swimming is Algae is not present.	Same as the other two. If Algae is present I would avoid, if there is no visible Algae I would likely swim.
32	Yes	Yes	the pictures of HABs are good.	In a large lake, with a small HAB it would say that you should not swim/recreate anywhere in the lake....	I guess I would not feel comfortable doing anything in this lake.... Would seek more information.	great pictures title = Algae awareness red and green signs	it is educational...do not find it confusing	watch out for HAB	same as sign #1	same as #1	same as #1

Appendix 5. Harmful Algal Bloom Focus Group Screening Survey Responses

	A	B	C	D	E	F	G	H	I	J	K
1	Demographics		Warning Sign			Algae Awareness			Danger Sign		
2	Live on lake or river in MI	Recreate on a lake or river in MI	What do you like about this sign?	Is there anything confusing about this sign? Please explain.	If you noticed this sign posted near a lake or river that you regularly visit, what would you do?	What do you like about this sign? Why?	Is there anything confusing about this sign? Please explain.	If you noticed this sign posted near a lake or river that you regularly visit, what would you do?	What do you like about this sign?	Is there anything confusing about this sign? Please explain.	If you noticed this sign posted near a lake or river that you regularly visit, what would you do?
33	Yes	Yes	Too busy!	Which one is which? I have to read too much!	Take a glance at it. Might look at the photos and the highlighted script!	The "Off Limits" symbol. It got my attention!	All of the small print. Too hard to read!	Pay attention to the "Off Limits" feature!	Red! "Off Limits!" It means business!	Small print is bad!	Pay attention to it and begin to wonder why it's in such bad shape. What caused this? What can "we" "I" "you" do about it?
34	Yes	Yes	I think people will ignore it like the do the invasive species signs	No	I'd assume it was about time. I figure I see them before the dnr does	Shows different types of stages to the algae bloom	Not really	Stay out and quit eating the fish from it	Red stands out as dangerous	No	Stop eating the fish or swimming in it
35	Yes	Yes	Photos show what it may look like.	No, but maybe should include who to contact if a bloom is seen	Feel sad & go home	Not as scary as 1st sign	Yes, is somewhat confusing - should put examples of blooms above what not to do	Look for a bloom, if I didn't see it, recreate	Red means stop	Wouldn't include bloom photos here, just warn people to stop	Go home
36	Yes	Yes	It's clear and concise	Not that I see	Rinse off if I did swim or come in contact.	Very similar to last sign	Color does not indicate caution	Read and rinse off if I did decide to swim or come in contact with water	Red indicates caution	Not that I see	Not swim in a algae bloom, and rinse off if I did swim or come in contact with the water
37	No	Yes	It makes me think 'Stay Away'	It's tough to tell the scale in all of the pictures	Stay out of the water	It's more positive (more green options)	Lack of scale in all pictures	Stay out of the water, but I wouldn't be as worried as with the previous sign	Red color grabs attention.	Lack of scale in all images.	Stay out of the water entirely
38	Yes	Yes	Red clearly indicates bad/no...green good/yes. Pictures are also helpful examples. But other than avoid...i want to know WHY and any other action I should be taking	Not really. However, knowing that there still are people out there that are not internet savvy...a phone number would be nice. I know that is harder to do (nobody to staff the phones"...but a lot of people ...especially older...simply don't internet.	Look for algae blooms and avoid them.	Red clearly is no/avoid...green clearly is yes/ok. Pictures good	No...but I like the last sign with the yellow instead of green...caught my attention more.	read it and look for algae to avoid	red circles clear on no/don't and green on yes/do. Pictures helpful	I prefer the yellow color...the red blocking confuses with the red circles	look for algae
39	No	Yes	It shows me examples of what I should be looking to stay away from.	Pictures could be bigger/clearer.	Read it and heed the warnings	Its more positive than the last one...the aqua green borders are less anxiety-inducing	No	Read and Heed information/warnings	Provides information and alerts me to a dangerous situation	No	Read and stay away
40	No	Yes	It uses pictures to help ID algal blooms, which is really helpful if you don't have an ecology background.	It looks a little bit "scary" like there's a large, immediate danger.	Probably look up the body of water online to see if there have been any reported blooms.	Again, the photos make it clear what to look for. The wording also feels less like there's an immediate threat and more informative.	Nothing in particular	Probably the same action: Look up whether there have been any reported blooms at that body of water.	Pictures, clear directions about what to do if you've been exposed.	It isn't clear about whether this body of water is dangerous always, or just could be sometimes. Gives the most threatening messaging of all three signs.	Probably avoid this body of water entirely.
41	Yes	Yes	Pictures showing the harmful algae blooms	No	Read it and abide by it	Pictures of harmful algae	No	Read it and abide by it	Pictures of harmful algae	No	Read it and abide by it
42	Yes	Yes	The use of picture help the public know what to look for.	No	Stay out of the water.	The pictures show what to avoid.	No	Stay out of the water and keeps pets and children out too.	Photos	The red is a bit distracting	Stay safely away.
43	Yes	Yes	I really think they need to be put up for everyone's safety	No	Make sure to everybody follow the signs	It gives us Awareness on what we need to do and what we need to take care of	No	Follow the signs on what to do	Once again follow the rules and do not go in one of the Lakes. That have the algal blooms they're dangerous	No	Probably not go swimming in the water

Appendix 5. Harmful Algal Bloom Focus Group Screening Survey Responses

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44	Yes	Yes	The photos	Honestly I probably wouldn't stop to read this unless the sign was huge. Maybe you could add a big red section at the top that says "STOP" or "DO NOT PROCEED"	Not read it and proceed	The photos	This just looks like an educational sign	Not read it and proceed	Ok, this looks like something I would read. It's good that this one is red and also the verbiage saying "danger" is more attention-grabbing.	No	Read it and evaluate the water/leave
45	No	Yes	There are photos with examples. It's attention grabbing.	No.	Review the sign and be concerned that it was an issue at the location I frequent... Then I would check out the water.	I like this signs coloring, but it does grab less attention as it doesn't look as severe as the last. It probably blends into scenery more. I like the example photos for those that aren't familiar with blooms.	No.	May read it, but it doesn't look as much like an urgent alert, it looks more like an informative sign for learning, so I may pass it by.	Like all the signs, I appreciate the photos and information.	No.	This sign looks like a very urgent matter. The red and "DANGER" would likely make be a little apprehensive to go near the water regardless of the presence of blooms.
46	No	Yes	works for me	no	stay out of the water	I like all of it, to the point	no	stay out of the water	its to the point	no	stay out of water
47	Yes	Yes	I like the quality and the details in the picture	There's nothing confusing	I'd stop going to that river and I'll also tell people about it	It shows more details on what we can and can't do	There's nothing confusing	I'd swim but I'd be very cautious	It's showing the level of seriousness and gives specific details	Nothing at all	I would leave the river and won't swim
48	Yes	No	Its looks more attractive and eye catching. Good concept	no	follow the instructions and if possible avoid the area	It looks attractive and eye catching	no	follow the instructions	Its looks attractive	no	follow the instructions
49	Yes	Yes	I like the visual clarity of the five circles above (though I initially thought the jet ski was a capybara). I like the clear/easy link from MDHHS. I like that it is gender neutral and inclusive.	The photos are not really big enough or very clear in my opinion. If you run them through a colorblind filter the look quite challenging for the most common type of colorblindness. I'm not colorblind but a lot of people are - possibly worth investigating further.	Read it but I'm a nerd, so....I think if it said WARNING - ALGAL BLOOMS across the top in big letters, you could get people who would otherwise ignore it. There are a lot of warnings about wind, trash, no lifeguards, etc., so it's possible making the specific warning big and clear would be helpful.	I like the top five circles across the top. Simple, inclusive, gender neutral. I like that the sign title includes algal blooms and that there's a clear link for more information.	The other sign made it a lot clearer that pets shouldn't be in the water and maybe that's useful. With this sign I'm thinking it's okay to have pets in as long as I wash them off. The colorblindness issues with the photos still stand and I don't think they illustrate algal blooms very well (photo 2 is so confusing to me, as is 4).	Read it because I am a nerd.	It's intense and I take the warning very seriously! It's clear what it's about from afar.	A few of these photos are not doing much for me (I've made this comment on the past two signs - reference those). Also those images tend to fade in the sun and the sun-faded versions of these will be even more difficult I think.	Read it and take it very seriously.
50	Yes	Yes	It's easy to understand	No	I will pause, read and obey the sign	It's clear	No	Obey the sign	It's easy to understand	No	Avoid contact with the lake
51	Yes	Yes	The actual pictures of what the sign is about.	No	Look for the Algal blooms and not let my grandchildren swim in the water if it exists	That's not all negative across the top	No, pretty clear	Not swim in water like the pictures. Or if I did shower afterwards.	Its clear. Like the colors used.	No	Not swim in this area.
52	No	Yes	Its very self explanatory	No	Avoid any algal blooms	This sign encourages people use resource if no algal sign is evidenced....	No	Go on about my business...	Its a strong warning being all in red	No	Avoid algal blooms
53	Yes	Yes	Looks good	Very clear	I would not go back to that lake	I like the colors, and the heading it's not as scary as the other sign	No	Be cautious	It's way to scary	No	I would not come back to this lake & I would want to sell my home ASAP
54	Yes	Yes	Simple	No- it seems straightforward	Go home or to another lake	It's simplicity	No	Check to see if Algae was present	It's simplicity	No- it explains itself	Go to another body of water for entertainment

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55	Yes	Yes	The fact it clearly depicts the dangerous sign which means there are harmful and toxic substances to health in the lake	No, the sign is not confusing as it clearly gives out the right information	I would be careful as very much as possible as I can to avoid harmful substances	It clearly shows the right thing to do and the harmful things to avoid	No, there is nothing confusing here	I would visit as regularly as I can and make sure I adhere to every instruction	It tells what parents and children should do to avoid being contaminated and infected	No, there is nothing confusing	I would obey every instruction
56	Yes	Yes	Warns us about toxic contact with algae.	No	I would check for algae first before making contact.	It shows both good and bad water.	No	Check for algae before making contact.	It tells me the toxic algae has been found here.	No	Stay away from the water.
57	Yes	Yes	They serve as warning sign	Not at all	IT make me know what is heard	They all so when to some and not when	not at all	I will know what they are meant for	It tell about danger	not at all	I will know what they stand for
58	Yes	No	Informative	No	Look for signs of algal bloom	Photo of algal	No	Report to the number listed	It states you need to stay out of the water	No	Keep adults ,children and animals out of water
59	Yes	Yes	It's easy to understand	Would like yo know when the algae was discovered, like a date the sign was posted	Research for more information	I like this better than the last one. Gives direction that clear water swimming is okay.	Would.like to ha e th3 date the sign was posted listed on it	Enjoy safe areas and stay away from possible algae zones	It stands out and has clear communication	Would like the date the sign was posted listed on it	Research for more info before using the body if water
60	No	Yes	It's straight forward and easily identifiable.	No.	Avoid contact with scums or rinse off if I can't avoid contact.	It's straight forward and gives several examples of HABs.	A little unclear on its purpose other than general knowledge. Would it be placed where HABs have occurred in the past?	Watch for HABs.	It signifies a warning very clearly.	No.	Avoid contact with the water, especially visible algae scums.
61	Yes	Yes	I love the sign because it shows warning to civilians	No, the signs their are really helpful	I'll listen to the warning	The signs shows warning for the safety of civilians	No, the signs are all okay	I will obey the instruction of the sign	It shows warning for civilians not to near the algae bloom in the water	Yes, there's no dog should be rinse off after water contact of algae bloom	I'll obey the instruction
62	Yes	Yes	It is clear I should not go in the water. Also it shows what the algae looks like.	Not really	I would follow its directive and look for algae before going in.	It also explains to not go in if you see algae. And shoes what the algae may look like.	The middle drawing looks like it's okay to swim in it whether algae or not until I read the words.	I might think it is okay to go I	It shows not to go in if we see algae .also shows what the algae looks like.	Not to me.	I would follow its direction and look for algae
63	Yes	Yes	It looks serious. It shows helpful photos.	Not really, no.	I would become depressed. I would reconsider my activities at that water.	It opens with an encouraging message "have fun..."	No	I would look out for green slime as shown in the photos.	It is very serious and gives fair warning.	No	I would become depressed and reconsider my planned activities. Eventually, I would probably go ahead with activities but I would be on the lookout for slime.
64	Yes	No	Its detailed look is very helpful in warning people of algal blooms.	No,there is nothing confusing about it.	I would stop to read it	It is helpful in spreading awareness about algae	No,there is nothing confusing about it	Stop to read it	It is very helpful in spreading the knowledge about how dangerous algal blooms are	No, there is nothing confusing about it	Read it
65	Yes	Yes	It is informative.	The pictures are kind of small and not very definitive.	Watch for possible HABs.	It is informative without being alarmist.	Again, the photos are small.	Keep an eye out for HABs.	It is specific about a known issue.	The photos aren't as important here because the statement is more definitive.	Leave.

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2	Live on lake or river in MI	Recreate on a lake or river in MI	What do you like about this sign?	Is there anything confusing about this sign? Please explain.	If you noticed this sign posted near a lake or river that you regularly visit, what would you do?	What do you like about this sign? Why?	Is there anything confusing about this sign? Please explain.	If you noticed this sign posted near a lake or river that you regularly visit, what would you do?	What do you like about this sign?	Is there anything confusing about this sign? Please explain.	If you noticed this sign posted near a lake or river that you regularly visit, what would you do?
66	No	Yes	I like the details. Pictures AND clear directions, along with contact information and directions in case someone does get exposed.	The picture in the middle must be a "mat"- it doesn't look like the rest. That is actually what has confused me when I have looked at information about it in the past. Is that also an algal bloom? Evidently, it is- but it seems to be very different.	figure out why it was happening and what could be done about it. Then I may actually go door to door with information to help my neighbors aware of what they could do to help.	It is very clear- just like the other one, it also has pictures and directions with details and information if you get exposed. It seems to have more information about what you CAN do and what you need to do after contact (allowing it)- but it seems more negative to me somehow. I know that doesn't make sense. I wonder if it is just the color? The other one definitely made me want to stay OUT of the water... this one seems more off-putting but I have no idea why.	The middle picture still seems to be significantly different than the others. It makes me wonder what do healthy or normal algae look like in contrast. We have long strands of normal growth in our lake (they treat it every year to keep it under control). I have also seen strips of this along bigger lake shores and thought it was okay to wade through it... now I wonder. It is good that there is a website to check out but I actually doubt I would do it at the beach unless I had little kids or pets with me.	I would do the same- see why it was happening and what could be done about it and try to raise local awareness. Admittedly, this one would make it seem okay to use the water as long as I was careful afterwards. I am not sure I felt that from the other one.	It is obvious and would make me walk over to take a closer look before getting in the water. It also has details and information along with clear pictures and how to get more information.	The middle picture looks significantly different.	I may just find somewhere else to go... The message is the same as the first one to me only the red color would make me (and my teenagers/ pre-teens when they were) go read it too. I would still want to know what caused it and what could be done about it
67	No	Yes	Good photos of HABs. The do not (touch, swim...graphics) cover the topic and should be ceassdy to understand.	At first I thought the jet ski was a dog swimming. But it became clear when I read the text.	Stay away from anything that looks like the pictures.	Again the pictures are very good. Enjoying clean water is a great thing, but sometimes clean-looking water can pose a health threat. Caution should always be used when enjoying our watershed. Many times there isn't clean water available to wash off people and pets. Good personal hygiene practices should be stressed.	Two red (do not logos) and only two green (ok logos) may allow some folks to think swimming has little or no risk... I think more caution should be urged in areas where contamination has been a evidenced.	Check to see if there are showers before swimming.	It is much stronger in the warning area. Good pictures.	It cautions against contact with HAB contaminated waters, but suggests that if you swim in the water one can just take a shower and all its well.	I would heed all precautions, and I wouldn't need a shower because I probably wouldn't take a swim. However in my youth I would have probably ignored such signs... That is unless my Mom was with me!!!! Yikes!
68	Yes	Yes	The sign are precise and say the message in a meaningful way	No. The sign is well indicated	I will not swim or do any form of activity there	The signs are well stated	No. The sign are clear and precise	I will abide my what the sign says	It gives accurate information about the lake and harmful algal boom	No. The sign are clear	I will abide by the signs
69	Yes	No	The sign save as warning for harmful substance	Nothing more	I will not move closer to it	The sign save as a warning for harmful substance. Because it help to pass information about harmful substance	Am not confused on anything, since I not it is damage symbols	I will not move closer to it	It give warning	Nothing more to confuse about	I will not move closer to it

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70	No	Yes	It is informative and seems to be right to the point. I appreciate the photo examples.	Not at all	Definitely be more aware of my surroundings as I have dogs that come with me. I would also try to educate myself on these blooms on my lake/river to see what I can do if anything to help prevent these.	This sign seems less frightening. But I wish it included that pets should not drink/swim in the water. The other sign had that.	Not confusing just seems to lessen the threat of the blooms to people and animals.	I would be more aware of my surroundings and keep an eye out for blooms. I would also want to know more about the cause and if there is things that can be done to stop these or lessen these blooms. But this sign is definitely less threatening feeling than the first.	It definitely brings back the threat feeling when it comes to these. Especially with the red. It is eye catching and gets the point across.	No straight to the point	Avoid the water most likely. And do research on my river/lake to find out more information. This sign gives me the feeling to stay out and away from the water.
71	Yes	Yes	It gives the public knowledge about how to deal with bloom.	I thought it was ok to boat/jet ski/kayak in water with bloom	Read it	It allows more activity	No	Read it	It creates fear	No	Read it
72	Yes	Yes	Its easy to understand	No, there's not	I will try to read it	Its appealing	No, not all	I will try to know what's about	It catches attention	No, is not	I will try and read what's there
73	Yes	Yes	The hazard is very well illustrated as is the warning. It also indicates what to do if you encounter this algae.	No.	Definitely take a look - as a reminder - and exercise caution before entering the water.	Again, the illustrations are very clear as is what not to do should the water appear contaminated.	No, not confusing but the green color used is not as attention-grabbing and blends with the photos.	Again, take a look as a reminder.	Illustrations are, again, clear and concise. The red commands attention and is a warning color.	No	Take a look as a reminder.
74	Yes	Yes	Simple graphics for avoiding water with potential HABS. Shows the variety of the visual appearance of potential blue green algae blooms.	Very busy sign. Needs to be simplified.	I would compare the observation of the current conditions of the site and decide based on the warnings what to do, or not to do, at the site.	The pictures of the variety of potential HABS.	Do not need the symbol for DO enjoy clear water, that is obvious. Also, should have a symbol DO NOT allow pets to drink water with algae blooms.	Avoid contact with the water with the depicted algae blooms.	Identifies that HABS have been found in the water	No	I would avoid contact of this water at this site.
75	Yes	Yes	I like the green water, the familiar "do not circle with a slash" icon and the descriptions of what algal blooms look like - and the yellow coloring	I think photo 2/3 & 4 are hard to look at.	Tell my friends that we must avoid the water and shore along the water	It seems to say if there is a bloom at Sally's but not at your house, I can swim at your house. Will I always be able to see the bloom?	yes, can you swim next to a bloom? if the water is clear? Is this what this is saying? Does a bloom in one area of the lake doom swimming in the entire lake. This kinda gives permission for dogs to go in the water if you wash them off.	Look for clear water to go into and shower after I got out.	I wouldn't get any arguments from my husband about avoiding the water. It is definite.	I would think this would only be posted after a bloom was determined.	Go to another lake.
76	Yes	Yes	It attracts attention, is easy to read provides necessary information.	I would change the jet ski graphic to a boat.	I would look at it!	It's attractive and visually engaging. The bottom line I'd perfect.	No	I would look at it.	I think this one is more powerful. Some people ignore the word, "Warning,".	Not at all	Stay on the shore!
77	Yes	Yes	I'm neutral. It's easy to read but "This water may contain ..." may not stop people for contact with the water.	I would line to see an 800 number to call to verify recent outbreaks in Michigan.	I would try to verify if the area tested positive. If positive, I would like to know when the levels decrease, and how you will post that the water is safe.	I do like this one better. If posted at a state park, I would like to see flags similar to those used on the ocean with ripe tides are present. A green flag, no risk, yellow possible risk and Red, do not enter the water, bloom is present.	I understand animals can die. If their is a bloom, showing your pet may not be enough.	We need a hot line to verify outbreaks.	I like this the best. The word Danger. I think that animals have died will make people more alert.	I think in all the signs, showing that someone can shower may make people think it's ok to swim if you shower.	Once again, try to verify current outbreaks.

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78	No	Yes	It is very clear about what you should not do in the water and what to do if you get sick after going in the water.	I like the pictures of the harmful algal blooms but it may detract from the message of stay out of the water. At first glance I saw do not do a bunch of things then I was drawn to the pictures. If my attention was called away at that point I would not have paid attention to stay away from the water.	Hopefully I would read the sign and stay away.	First I like it is more positive than negative but I own a Marina and my fear would be that people would only see the positives and not read what to stay away from.	Not really confusing but with the softer color it may get overlooked. Yellow signs people read. This just looks like some rules that maybe people will skim over. Also what I liked about the sign of more positive can work against you because people will only see the swimmer and swim.	Possibly look it over.	I like this one the best. The red makes me stop and look and read what is going on in the lake.	No. What I thought about the pictures in the yellow sign I now look at the pictures as a warning.	I would stop and read this as I would hope my boaters would also.
79	Yes	Yes	The dual signage of real-life photos to help identify HABS and easy to read pictograms.	No	I would screenshot it for reference	I like the green border and Algae Awareness title. The green adds an extra element.	No	I would read and screen shots look for algae blooms	I like the pictograms and identification photos.	Nothing confusing - I'm turn about the red border. I find it eye-catching, yet in your face. I prefer the green border.	Screenshot and look for algae blooms
80	Yes	Yes	I like the description of the sign, it is quite understandable.	I don't find anything confusing about this sign.	If I noticed this sign, I would adhere to it.	I like the images used to pass the information, it is explanatory.	I didn't find anything confusing.	I would adhere to the warnings indicated on the sign.	I like the idea of the sign and the explanation of the dangers involved.	I didn't find anything confusing about the sign.	I would adhere to the warnings and information stated.
81	No	Yes	I like that there are pictures to help identify harmful algal blooms.	I wonder if the pictures could be confused with non harmful blooms.	I would avoid swimming or fishing in that let of the water.	I like that it's called Algae Awareness and that it reminds people to go ahead and enjoy water that's clear of algal blooms. This sign seems less alarming. I like the description of HABS.	People might confuse non harmful blooms with HABS.	I would proceed with caution.	I like the descriptions of HABS.	It says a harmful bloom has been found but it's unclear exactly where and whether that means the whole body of water is off limits.	I would avoid that body of water.
82	Yes	Yes	I like the indepth details, I like the fact that it contains images to help better in understanding the message being passed across.	I didn't fine anything confusing about the sign.	I would make sure I stay away from such River or lake. Most likely maintain minimal contact with such water.	I like the features of the sign, it is quite explanatory and understandable.	I didn't find anything confusing about the awareness, it was understandable.	If I noticed it I would adhere to the warnings on it.	I like the color used to signify the danger of the algal blooms.	I don't find anything confusing about the sign. It is understandable	If I noticed this sign, I would adhere to the warnings.
83	Yes	Yes	Very informative with out being to detailed, pictures help that actually show what it looks like	No	Read it and pay attention to the body of water that it is pertaining to	I like that it says "have fun in the water" also do's and don'ts. I think yellow in the previous sign grabs your attention better	No	Read it and be aware of my surroundings in the body of water it pertains to	I don't care for this one. It immediately freaks me out, with the DANGER and red	No	Probably make me want to go elsewhere

Appendix 5. Harmful Algal Bloom Focus Group Screening Survey Responses

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84	Yes	Yes	It is very clear about which activities you should not participate in while in or near HABS with helpful graphics. I also appreciate that it gives several examples of what HABS can look like, since they often take different forms based on conditions or location. The "HABS look like..." line is helpful since it gives people a frame of reference from their own lives to look out for	It doesn't explain what HABS are or how they may affect people or pets that come into contact with them. Instead of including this on the sign, putting a link to a site with information on HABS may be helpful in educating people	I would certainly be more alert and inspect the water before going in. If this river or lake was closed because of or affected by HABS often, I would most likely look for somewhere else to recreate. A sign like this, while helpful to keep people healthy and out of toxic water, would definitely unsettle me.	I like this sign more than the last sign. The blue color is much more calming, and lends itself better to the awareness and education message, rather than the previous DANGER sign. I think that having more Do's than Don'ts will be more encouraging to people that want to recreate in this lake. It is certainly more welcoming, while still containing most of the same good information from the last sign.	I would say that I am less confused by this sign than the previous sign, but that may be a function of being less unsettled by the color and message of the sign. It seems to contain pretty much the same information	I would be on the lookout for HABS, but certainly still engage in recreation. This sign is much more geared towards awareness rather than warning, so I feel more empowered to decide for myself whether there are HABS and if I want to recreate in the water or not.	I definitely know NOT to go in the water that this sign is posted near due to the red color and large list of DON'Ts. The information about what HABS look like and the practices not to take part in is still helpful, but is overshadowed by the alarming nature of the sign.	Where is the HAB? Is it affecting the entire body of water? Can I still recreate in this area, or is it closed to the public? Since this sign signals danger, it would be helpful to include a beach closing or something of the sort that explicitly tells the public not to recreate in this water	Most likely leave and find somewhere else to recreate. I generally don't mess around with red signs.
85	Yes	Yes	It's clear and graphic	It might imply to people that all algal blooms are harmful. It might be counterproductive to add something explaining that some algae is healthy for lakes, but people tend to demonize plant life after seeing something like this.	Try to find out who is doing the sampling and what kind of algae they found. Of course, I would also not go in the water or allow our dog in.	Slightly less alarming, with the lighter "have fun".	Still might cause people to demonize algae.	Same as other sign.	I can't tell that it's different from the first one without going back.	as above	as above
86	Yes	Yes	The way its very clear about the dangers of the lake	No. I find it very direct and informative	I will stay away from the lake	The message is clear	No. I think its very clear	I will stay away from the algae	Hiw the message is very clear	No. The message is very clear	I will not swim in the lake
87	Yes	Yes	Red circles with slashes/open green circle very clear.	This water "may" contain HABS. My question would be does it or doesn't it?	I wouldn't go in the water. I would probably contact Michigan.gov/HABS. I might also contact the health department to see what was going on.	I still like the red circles with slashes/open green circles. However, this sign tells me what to look for in the event there is HAB. It is educational sign, not a warning sign.	No	Go to the posted website. Since current HAB sites are not posted, I would wonder if there was an HAB in a part of the lake not visible from the sign.	Grabbed my attention	No	I sure as heck would not go in the water!
88	Yes	Yes	This sign is very self explanatory and helps a person who views it stay away from that section of the water.	Nothing that I can determine.. the color charts of what algal looks like are self explanatory also.	Unfortunately, I would stay away from that section of water. I would look farther down that body of water and if no sign was around and the water look safe then a person could recreate there.	I like this sign in that a person could determine the condition of the water and make a decision as if to recreate there. To me, this tells a person that this is a possibility under special conditions, the water could be too warm depleting oxygen in the water and algal will grow there.	No, to me, this sign lets the observer make a decision based on what the water looks like.	I definitely would be aware to look at the area of water and just be aware that this could be a possibility.	Framing everything in red alerts the person to stay away from this area as it has been determined that it is harmful to persons and pets.	Nothing, the red alert says it all.	I would choose to go somewhere else where it was safe.
89	Yes	Yes	Easy to understand.	No	Obey the sign.	Direct and to the point.	No	Read and obey	Easy to understand	No	Read & obey
90	No	Yes	It is straight forward and informative.	Not that I'm noticing.	Check the area for signs of bloom.	It is very clear to understand.	No	I would check the area for blooms.	Easy to understand	No	Check for blooms

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91	Yes	Yes	information is laid out. Easy to read	No	Not go in or use water	Easy to read and understand. Clearly laid out	no	read it, and be aware if I noticed anything on water	Easy to read and understand	Maybe how long they typically last?	probably not go in water
92	No	Yes	Very explicit in what to avoid	The picture with the boating, fishing, jet skiing. I think it would be better if you just had a regular boat as the symbol.	Stay out of the water.	Gives a positive and negative, instead of just negative slant to the sign.	No	Look carefully to see if the water is safe.	Do not like it at all.	Way too negative.	Stay out of the water at first, but later might not believe that the algae is still there.
93	Yes	Yes	Somewhat informative	Yes, no explanation of how to identify harmful vs nonharmful algal blooms. What about breathing around harmful blooms?	Stay away.	Promotes awareness instead of doom.	Not all blooms are dangerous.	Still visit.	Direct. Condition identified. Stay out.	Is this a current condition or was it spotted in the past? And when in the past.	stay away.
94	Yes	Yes	Very informative and easy to understand.	No	Take a look at the condition of the water.	Very informative and discriptive.	No	Look at the water prior to entering.	Descriptive and easy to understand.	No	Look at the water.
95	No	Yes	Basic illustrations, layman's terms,	no	read and follow guidelines	I do not. Conflicting information	Rinse after any people & pets after contact. Why?	Think that the sign was poorly drafted and use my own common sense.	Danger=red	The rinsing of people and pet should be listed somewhere else. IF people and/or pets entered the water then immediately rinse, etc... (in	not go in the water
96	No	Yes	Warning word up high. Do not circles plain and readable. Words underneath do not do circles simple and understandable. Photos good. To contact info simple and quick.	Read it and follow directions.	Read it and follow directions.	No warning posted. Not that dangerous.	Too positive.	Read it and think everything ok.	Danger instead of warning about algae blooms.	No.	Read it and follow directions.
97	Yes	Yes	comprehensive	not simple enough	look at the water	comprehensive	not urgent enough	look at the water	comprehensive. good warning signal	no	look at the water. not swim.
98	Yes	Yes	Its a nice sign....attractive, colorful, eye-catching, BUT its just a bit TOO busy, and most people will glance at it and NOT study it. They want to get out on the water, and have a limited time frame.	No	I probably would do my own visual assessment of the water, and if deemed a threat, I wouldn't enter the water, but might ride (dry) in/on a watercraft.	Again, its colorful, attractive and eye-catching, but a little too much information for a quick tutorial.	No	Make my own visual assessment then act accordingly	Colorful, attractive, & eye-catching	No	Make my own visual assessment and act accordingly
99	Yes	Yes	Photos of a bloom as well as applicable warnings	No	I would be aware of what a bloom looks like and watch for signs of a bloom	Photos and applicable warnings	The color	Take notice and move on	Color, photos and large "Danger" at the top of the sign	No	I would be well aware of a potential bloom in the area
100	No	Yes	Explicit design for what/what not to do as well as direct written communication	No	Probably stop going	Explicit design & written communication	No	Be more mindful of algae blo	Clear, consider, direct	No	Stop going
101	Yes	Yes	Clear directions and pictures ⁹	What actual symptoms would present if exposed.	Avoid green slimy areas	Includes a positive. DO ENJOY CLEAR WATER and Have fun in the water. Balances the message	Again, what symptoms would present	Avoid green slimy areas and take shower rinse if I was unsure	Clear warning. Bright colors	Where exactly is the algae? Entire water body?	Would not go in the water
102	No	Yes	Real life pictures clearly showing actual blooms	No	Looks for signs of algae blooms	Clear pictures of actual blooms	No	Looks for evidence of algae blooms	Clear pictures and descriptions	Does not give location of the bloom	Look for evidence of a bloom

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103	No	Yes	The symbols are attention-grabbing.	The images (photos) may be hard to understand (as in, what am I looking at?). Also, it kind of gives the impression that I should stay out of the water all the time, not just during an algal bloom that I'm being asked to determine, on my own, whether it is present or not. Couldn't this sign be posted anywhere?	At first I would be alarmed, but then as a freshwater ecologist, I'd understand the message and decide from looking at the lake whether I wanted to recreate there or not.	I like that it is more informational than scary. Good balance of dos and don'ts.	Still not thrilled about the photos.	Same - I would read it because I'm interested in learning about water. Then I would decide from looking at the water about whether I wanted to recreate on/in it.	Clear "don't" symbols.	I don't like it because algae blooms are temporary and this makes it sound like I should never go near this water body ever. Also (should have mention this before) but the text about "Habs look like..." could be just about anything. I know it's tough to describe them concisely.	Be positioned to run screaming away, but as a freshwater ecologist, I would read and interpret the information myself.
104	No	Yes	Very clear	Not to me	Look for harmful algae blooms	I like the colors	Is "do enjoy..." really necessary?	Look for algae blooms	Clear	No	Stay out of the water
105	Yes	Yes	I think it tells the full story	Not to me	Stay out of do as the sign says about contact	the pictures are great and easy to understand	not to me	Again do as the sign says	Brighter and grabs your attention more	not to me	Stay away
106	Yes	Yes	Very informative	No	Look for algal blooms before entering the water	Informative	No	Look for algal blooms	Alerts danger	No	Stay out of the water
107	Yes	Yes	Easy to read and gives an example of what is being conveyed	No	Would need what the sign says. The sign is there for a purpose.	Tells one to use water but beware and watch for harmful Algae	Yes . In one place two signs are actually telling you to stay out of the water, even though the initial sign say have fun in the water. The last two or so tell you what to do when you come out of the water.	I would watch it carefully as the type of message could change, as conditions change.	Alarming and shouts danger	Yes the last sign shows showering, however you are told not to enter the water.	Stay out of the water. Probably not return until sign changed from danger...
108	No	Yes	Clear instructions. Useful photos.	Are you recommending rinsing after all contacts and not just if there is a HAB?	Seriously consider not entering the water at all.	Better. Does not seem like a notice that HABs are always present.	No, OK.	Look at the water.	Again, very clear, but also very discouraging. Looks like it might be one for temporary use when HABs have been verified. But with no date, that's uncertain.	It could be a good version to use as a temporary sign with dates attached for the hazard period.	Assume that there were active HABs and opt out of the water.
109	Yes	Yes	Both pictures and words to show what to do and not to do. Pictures to show what it looks like.	May contain. If there were some way to tell me it does contain or it doesn't contain algae bloom. More specific like if you see anything like these pictures avoid water e.g.	Wonder if it contains algae bloom. Figure out how I could tell for sure.	Again both words and pictures.	Can you swim etc in parts of the water that doesn't have algae blooms?	Cautiously check out the water for clear signs before getting in.	Again words and pictures	This is the least confusing one.	Avoid water
110	Yes	Yes	It is very straightforward and appropriate as a warning.	No	Move to an area where there is no bloom and avoid recreating in an area where the algae is visible.	It offers information on what the algae bloom looks like so that the public can use good judgment to avoid contact.	No	Be on the lookout for an algae bloom, but still recreate if none is visible.	Again it is straightforward and delivers an appropriate warning to avoid contact or recreating in the immediate area where the bloom is present.	No	Avoid that area.
111	Yes	Yes	It's very detailed and very clear.	No	Be more vigilant	Also very clear	No	Be more vigilant	A little shocking, but important, and very clear	No	Be extremely watchful
112	Yes	Yes	The signs are all easily understood without the use of words.	N/A	I would comply with the sign.	The color code helps - Do Not Do This and You Should Do This.	The dog taking a shower is not clear - are we to assume the dog went swimming earlier?	I am not sure I would do anything about the sign with the dog taking a shower.			
113	Yes	Yes	Beautiful	Water shade and somehow colourful	I will take caution and be careful	Swimming is allowed	The animal in the image i dont know why	Go back			
114	Yes	Yes	Seems clear and to the point to me	No	I would look at the water before swimming	Seems a little less scary than the first one	No	Look at the water before entering			

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	A	B	C	D	E	F	G	H	I	J	K
1	Demographics		Warning Sign			Algae Awareness			Danger Sign		
	Live on lake or river in MI	Recreate on a lake or river in MI	What do you like about this sign?	Is there anything confusing about this sign? Please explain.	If you noticed this sign posted near a lake or river that you regularly visit, what would you do?	What do you like about this sign? Why?	Is there anything confusing about this sign? Please explain.	If you noticed this sign posted near a lake or river that you regularly visit, what would you do?	What do you like about this sign?	Is there anything confusing about this sign? Please explain.	If you noticed this sign posted near a lake or river that you regularly visit, what would you do?
2	Yes	Yes	Specific information and graphics make the instructions less ambiguous.	No	Avoid getting into the water						
136	Yes	Yes	Very informative	the different dangerous algae	reconsider going in the water						
137	Yes	No	Very informative	No	Not swim or fish						
138	Yes	No	Very informative	No	Not swim or fish						