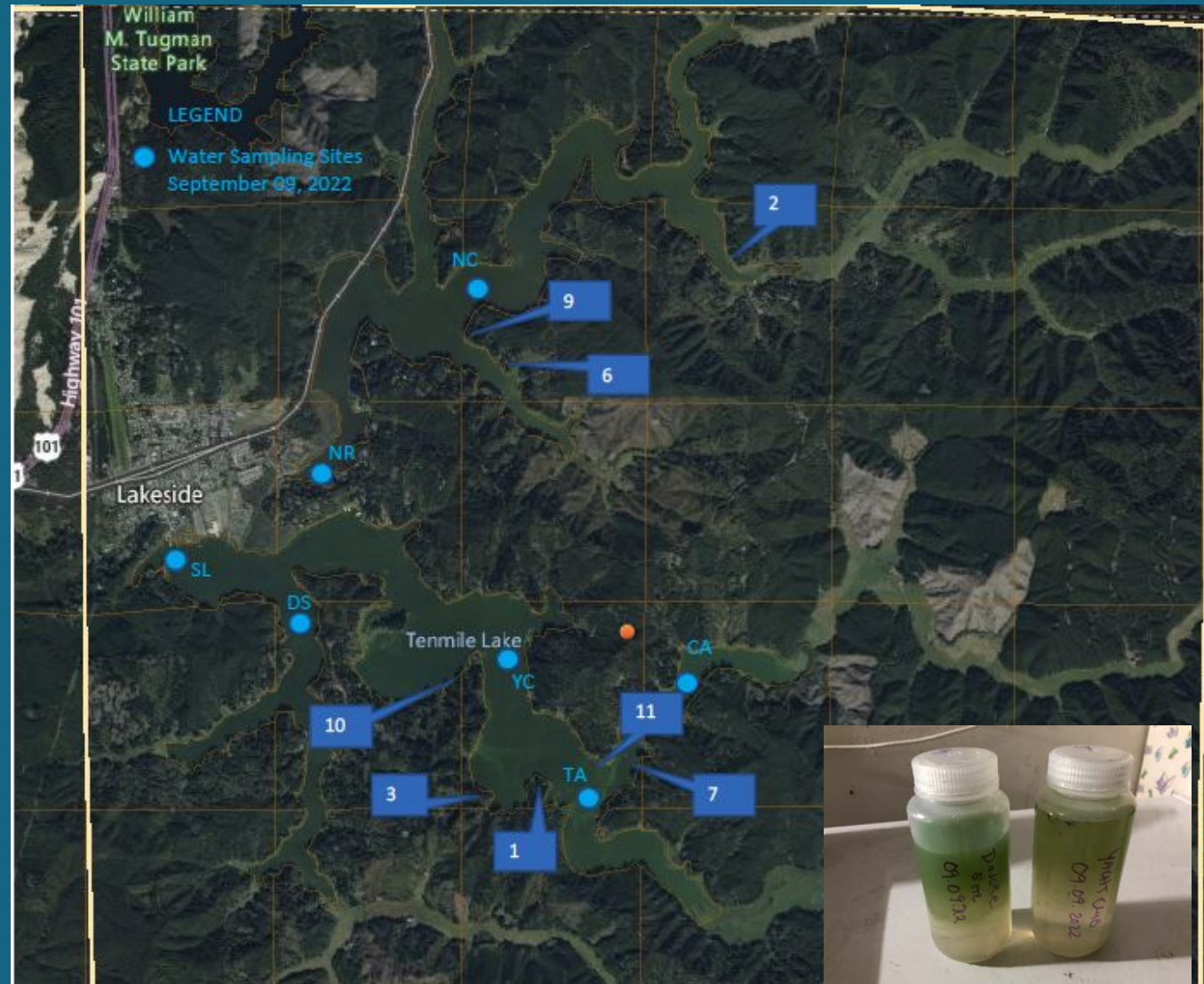


# Harmful Algal Blooms: Community-Based Participatory Research to Improve Rural Public Health Practice



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# Project Overview



## Purpose

- To understand how freshwater cyanobacterial harmful algal blooms (cyanoHABs) impact health and well being in rural communities facing decreased public water infrastructure availability and decreased surveillance of cyanoHABS.
- To ascertain the disparate public health practice challenges to reducing the impacts of these hazardous events within rural communities.



## Research Site

Tenmile Lakes, Lakeside, Coos County, Oregon



## Timeline

March 2023 through March 2024



# Research Questions

1

How do Tenmile Lakes residents perceive the risk posed to their health and wellbeing by cyanoHABs? What views do they have about how public health agencies monitor lake water for cyanotoxins and respond to bloom events?

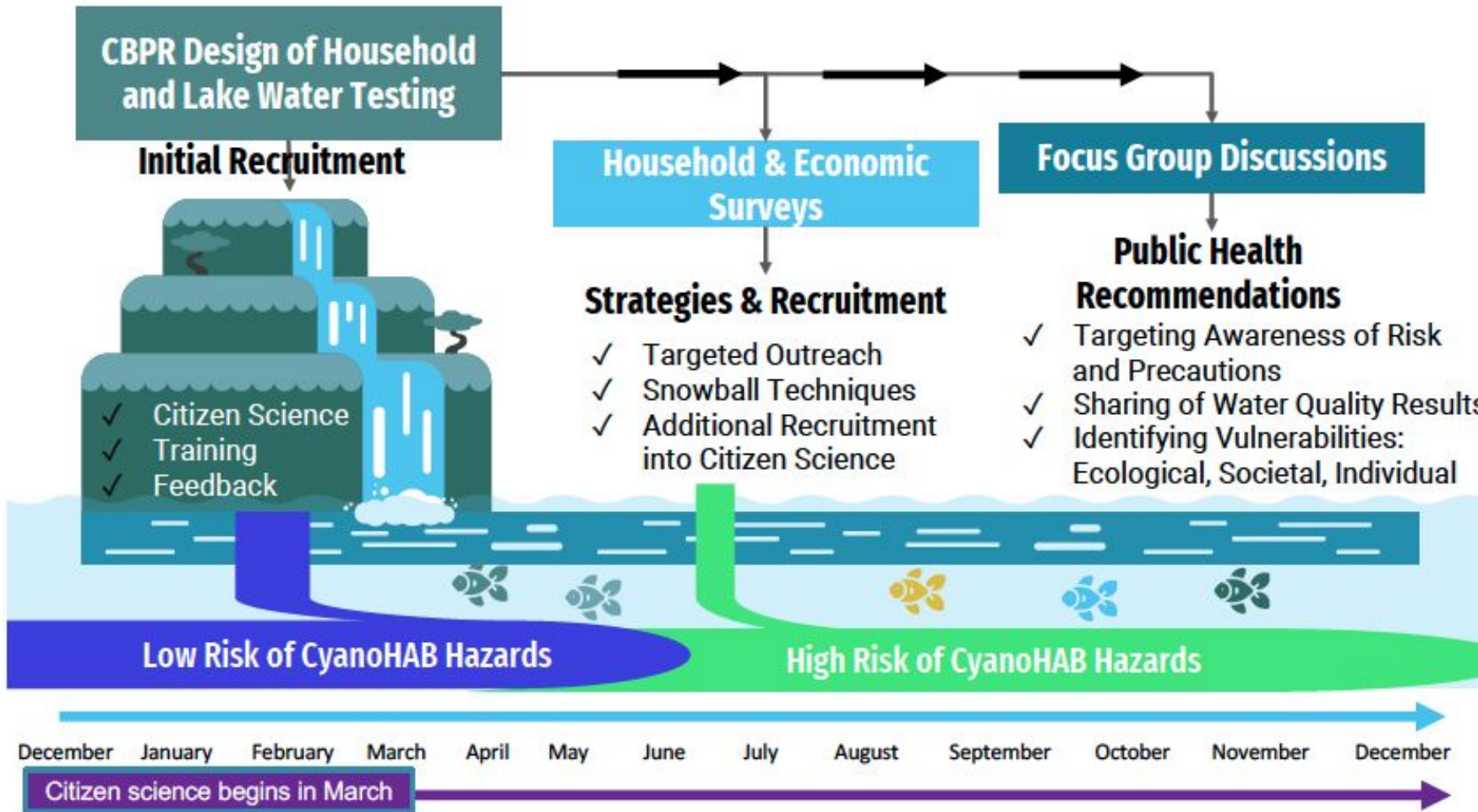
2

What is the risk of cyanotoxin exposure for individuals who use the lakes for recreation water and for Tenmile households that draw lake water for domestic use and consumption?

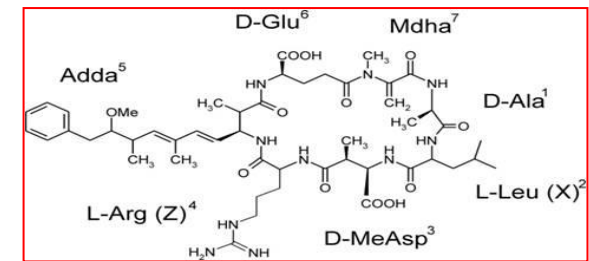
3

What do Tenmile Lakes residents recommend that public health agencies do to improve their cyanoHAB monitoring, guidance, and response in the area?

# Methods



Citizen Science Component:  
Bi-weekly testing for cyanotoxins throughout bloom season of lake water at source and after household treatment



Microcystin-LR

# Preliminary Findings

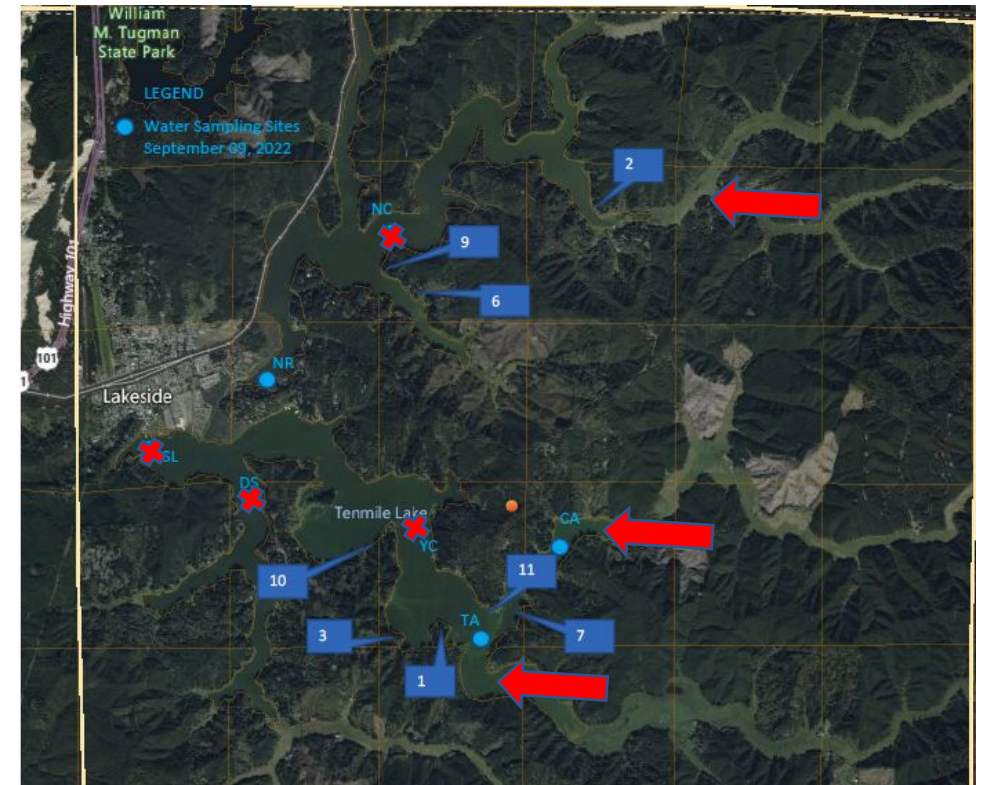
- Community-based methods revealed high levels of distrust for federal, state, and local public health agencies because of conflicting messaging, lack of transparency, and little community engagement about hazardous bloom conditions.
- Through open and transparent discussion, real concerns and vulnerabilities emerged.

Theme	Representative Quotes
Drinking Water Concerns	"I am hesitant to drink lake water even if I had better treatment. Especially for my kids to drink it. Also interested in how or if the harmful algae sits stagnant in our little cove and if that means it stays longer or has more impact or not."
	"We would need to spend a lot to better treat the H <sub>2</sub> O so we could be there more regularly. We bring our water from Portland for drinking. "
Economic Burden	"It definitely affects my business bottom line. We have more vacancy when the blooms are present."
	"The cost of bottled water and filters cause increased costs for residing in the area."
Animal Health	"We worry in summer months with pets drinking directly from the lake when we are not around to prevent it."
	"Friends bring dogs to our house and I worry about them drinking the water. "
Recreational Activity Concerns	"I worry that I will less and less be able to do the things I love safely (swim, fish, tube, etc.) We already have to limit our activity on the lake in late summer and fall. "
	"We see more on our own visually in kayak or small boat... Not all areas have signage, and it appears to be quite changeable, both within one season and also from year to year."

# Preliminary Findings

Results from water samples in September 2022 indicate that Tenmile Lakes residents and visitors must receive public health information potential risk and ways to reduce that risk of exposure in drinking water, as well as recreational situations.

- Four out of seven surface water samples from September 2022 tested positive for microcystins (marked in red X) on map.
- Exceeded OHA and USEPA ( $0.3 \mu\text{g}/\text{L}$  for vulnerable groups) and WHO ( $1.0 \mu\text{g}/\text{L}$  for lifetime exposure) guidelines for potable water.
- Spatial and temporal variation to consider. Call out boxes show household participants.



# Public Health Implications



1

Rural communities affected by cyanoHABs have unique challenges that must be addressed within both the local natural and cultural resource context.

2

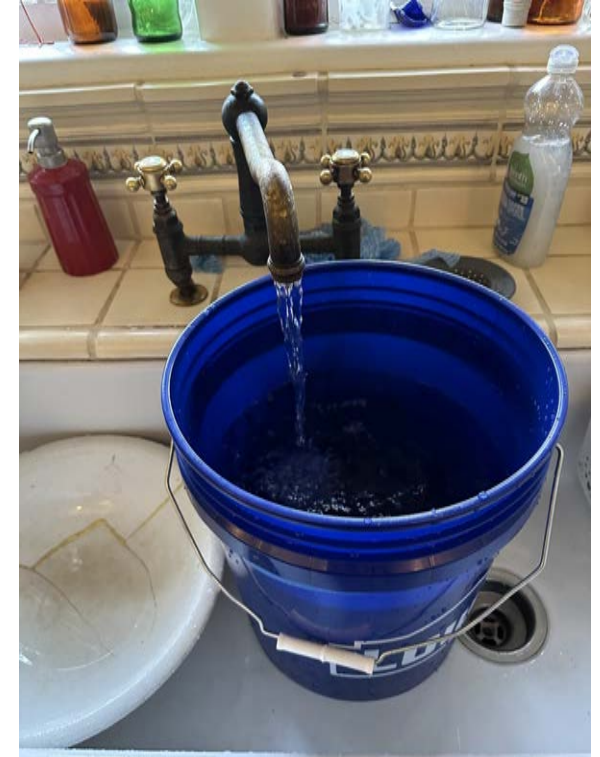
Public health efforts should develop strong local partnerships and also employ citizen science and community-based projects that foster transparency and trust.

3

Our findings point to the need for improved guidance for households using private water treatment systems and improved public health messaging for tourists, seasonal visitors, and newcomers to the Tenmile area.

# Public Health Implication

1



Public health efforts should develop strong local partnerships and also employ citizen science and community-based projects that foster transparency and trust.





# Acknowledgements

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