Effects of Harmful Algal Blooms on Walleye Vision

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Collaborators

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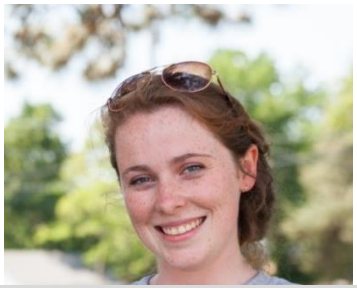
Jeremy Bruskotter

Andy Oppliger

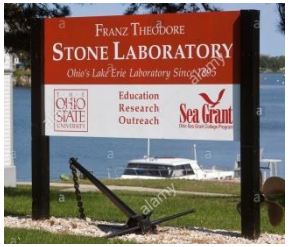


Caroline McElwain

Elizabeth Bertolini

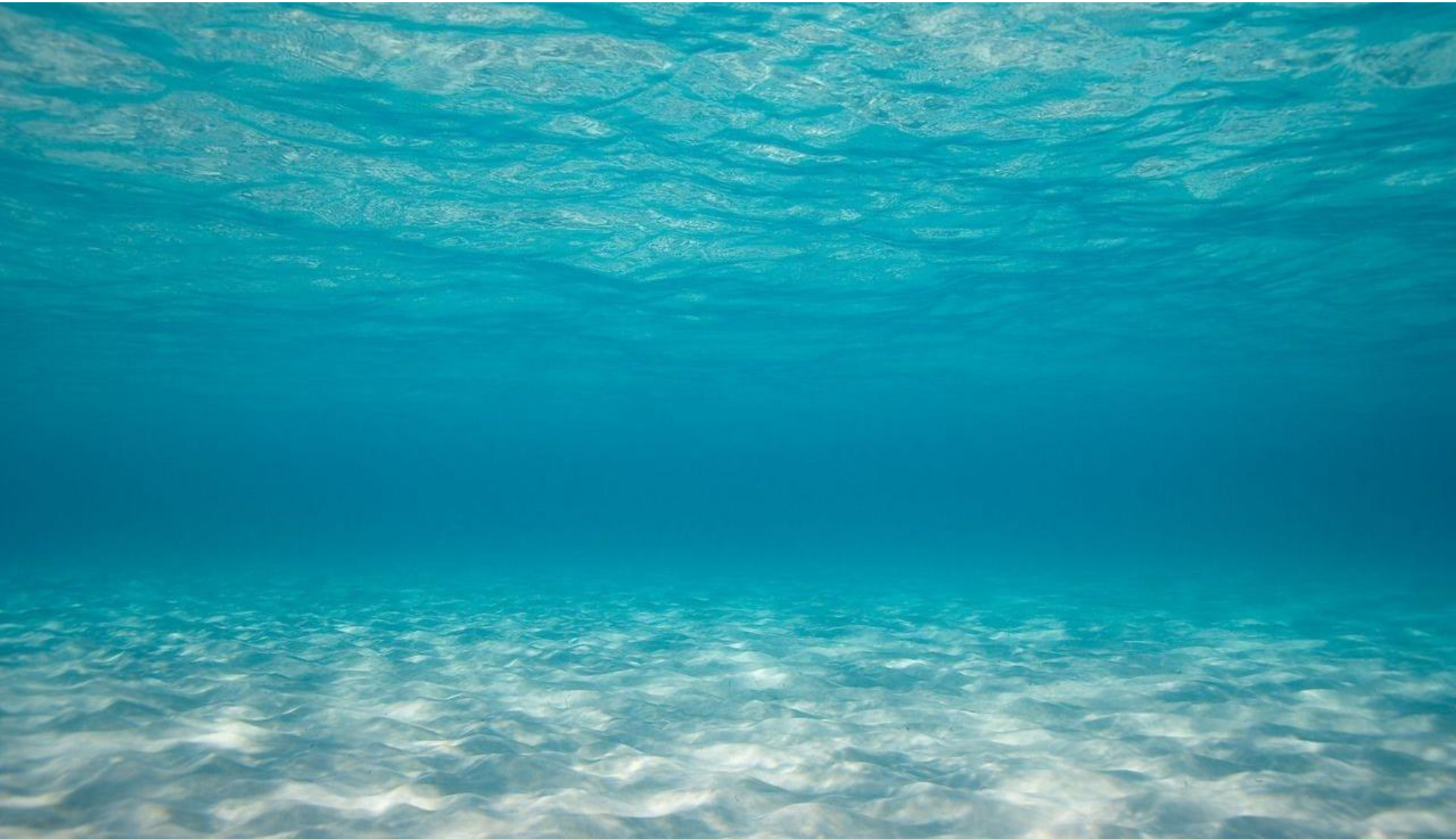
NOAA
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

Sea Grant



LAKE ERIE
CHARTER BOAT ASSOC.

Can fish see the bait on the hook?



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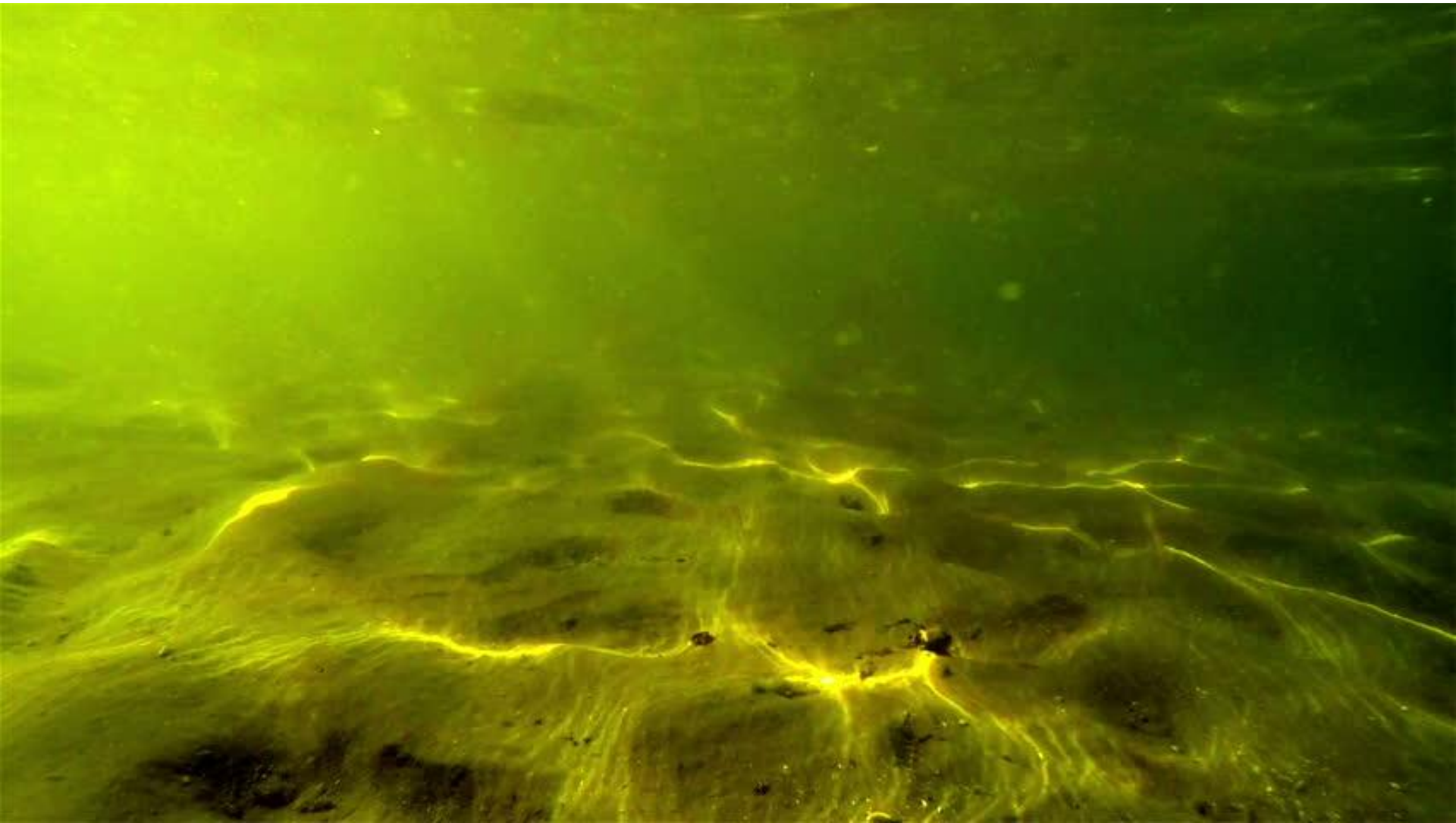
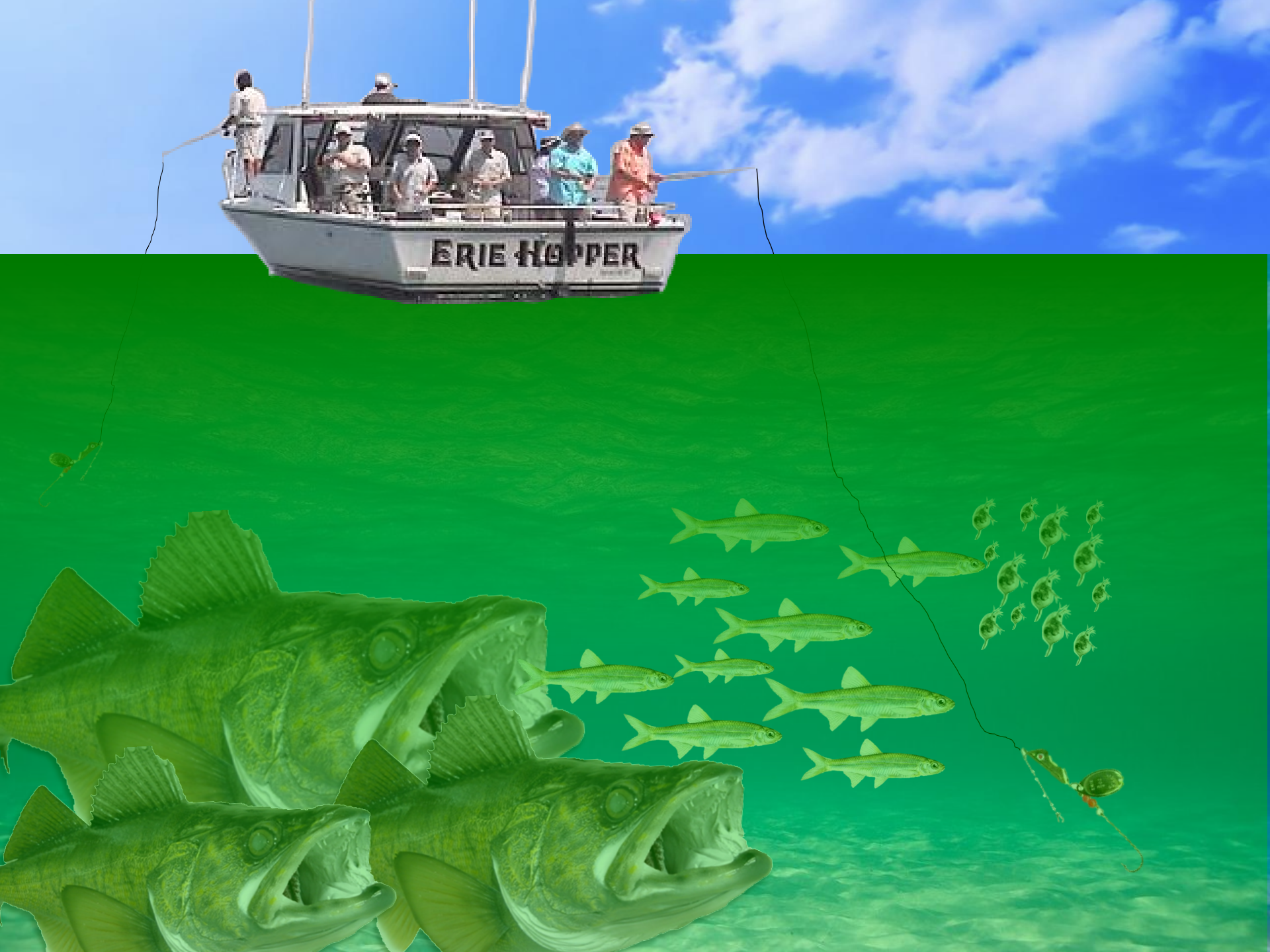
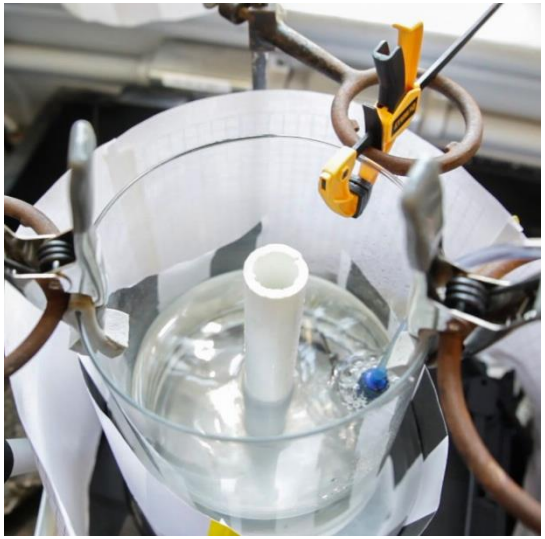



ERIE HOPPER

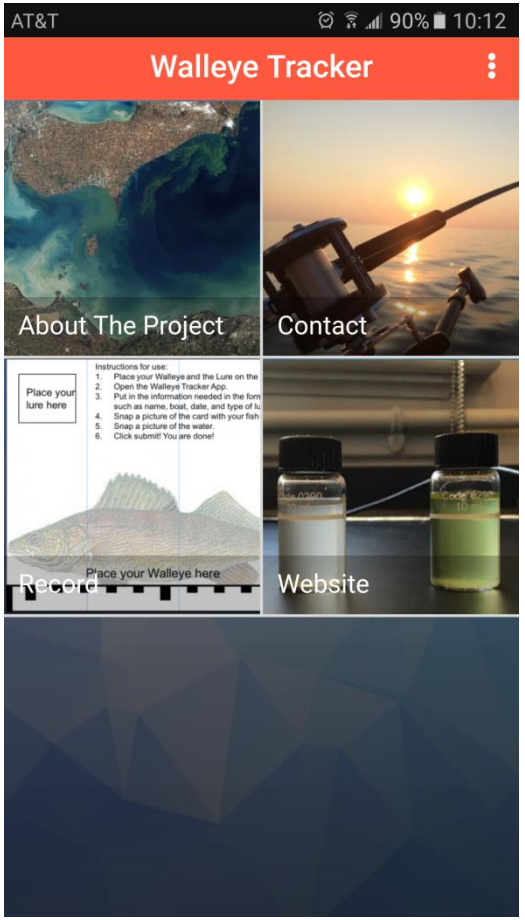
Can fish see the bait on the hook?

Turbidity

Visual Abilities



Citizen Science



Turbidity

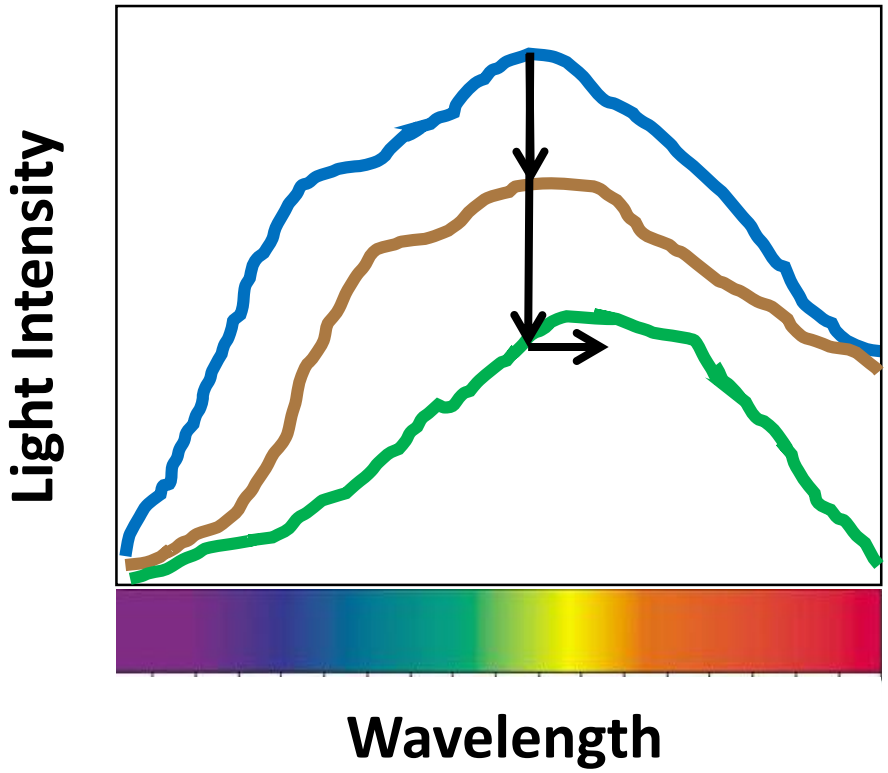
Inorganic Turbidity – Sediment

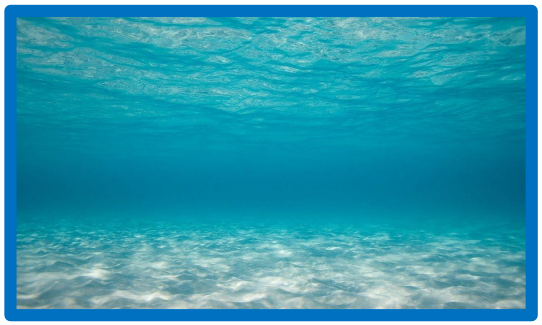
- Severity of storms, increased runoff, and other disturbances
- Shallow and close to urban pathways

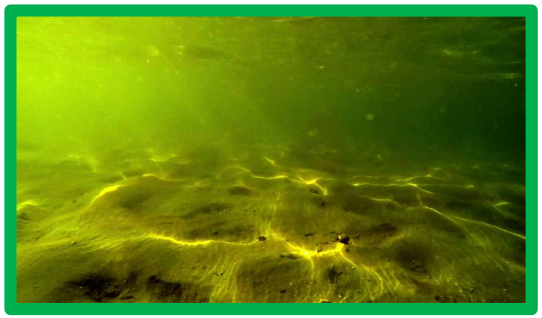
Organic Turbidity – Algal

- Nutrient loading from agricultural and urban management processes
- Shallow locations, tributaries

Visual Environment







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Turbidity

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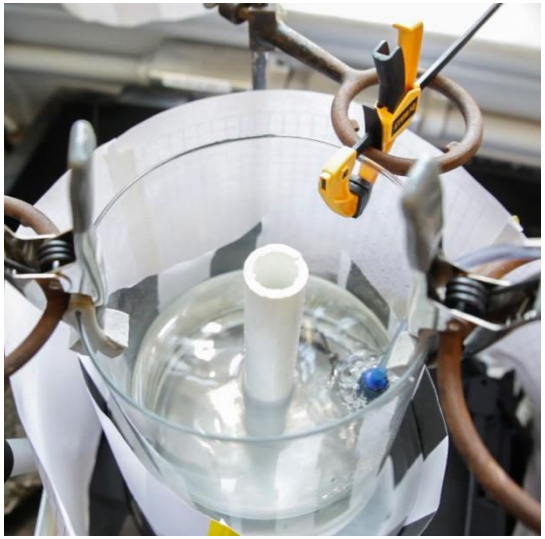

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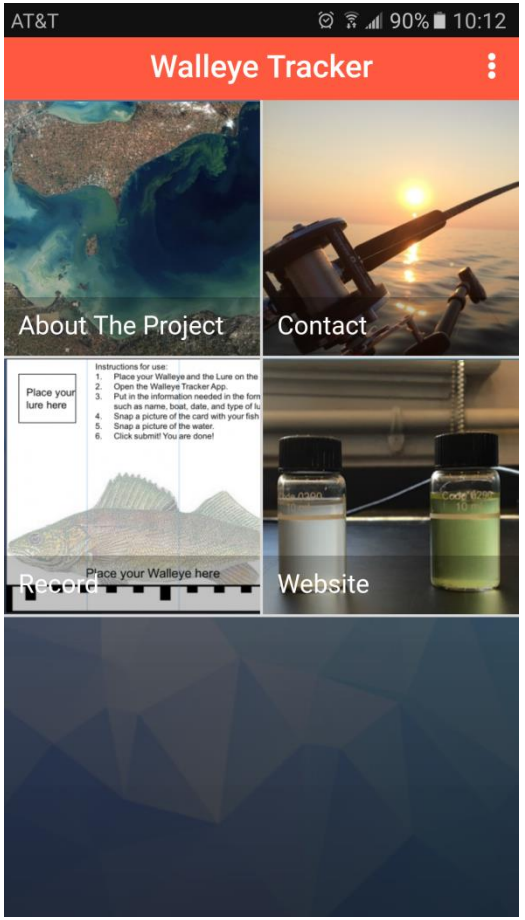
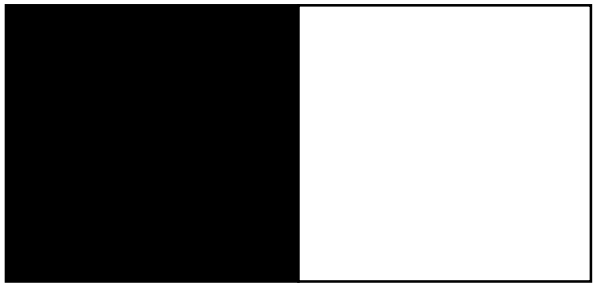


How well can Walleye see?

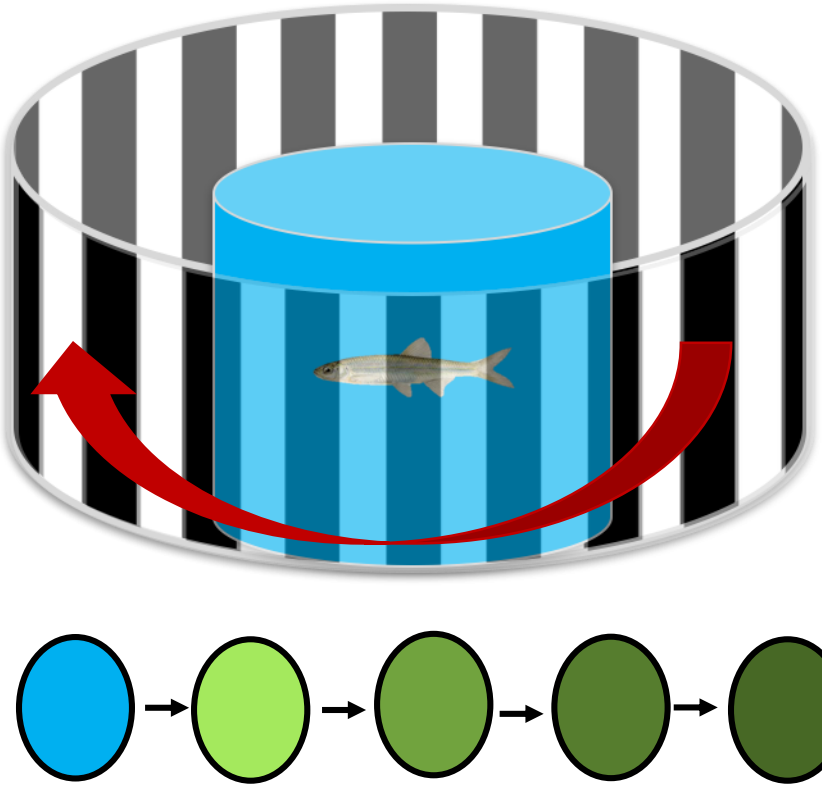
Visual sensitivity = the ability of an individual to distinguish between an object and its background



How well can Walleye see?

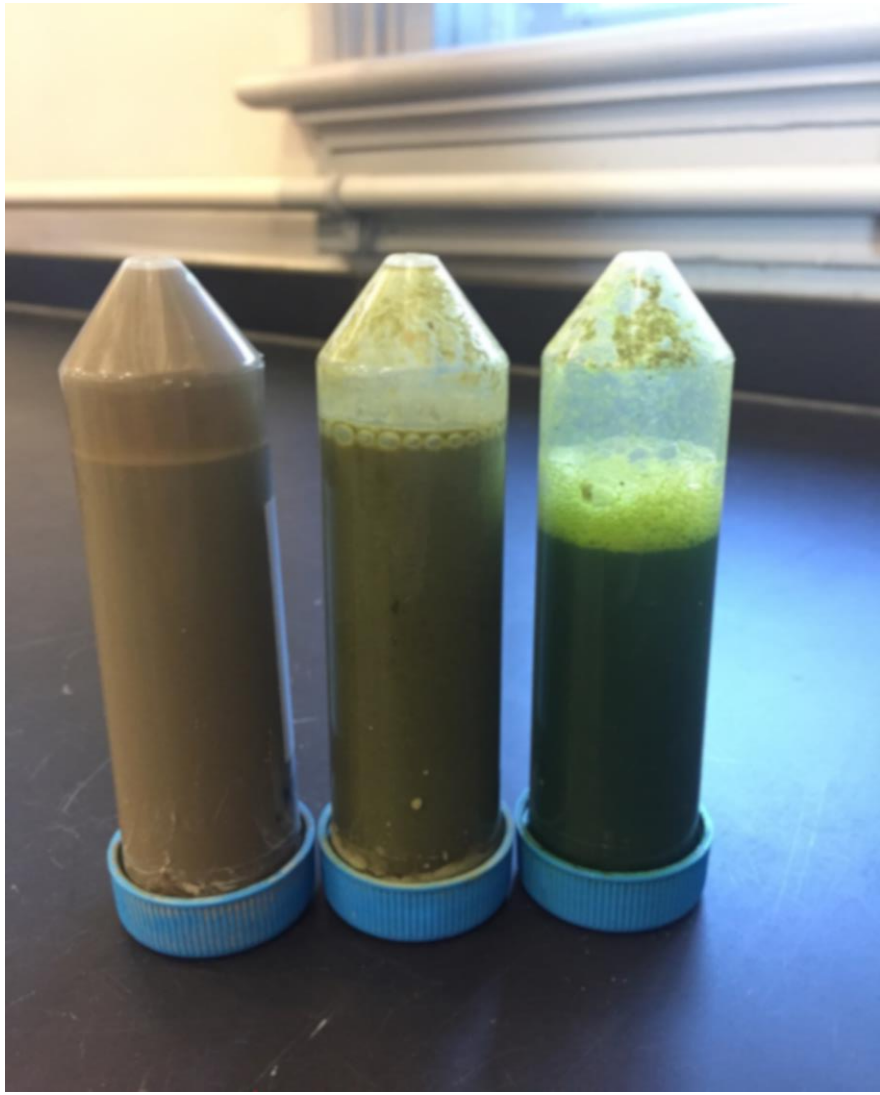
Optomotor response = natural response of an animal to follow a moving stimuli

Visual detection threshold = the point at which an animal is unable to differentiate between the object and its background



How well can Walleye see?

- Incremental addition of treatment (sediment, algal, or combination)



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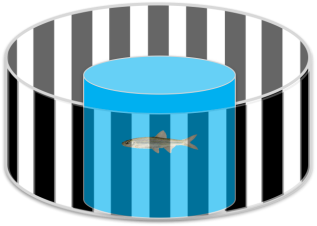
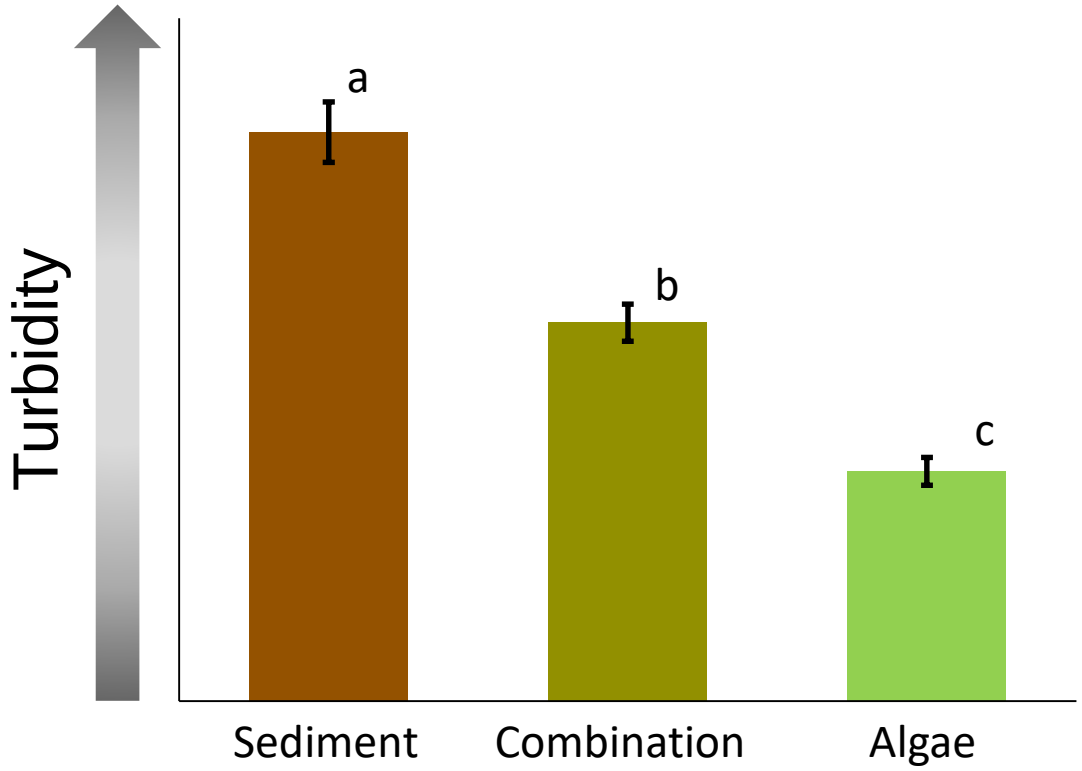
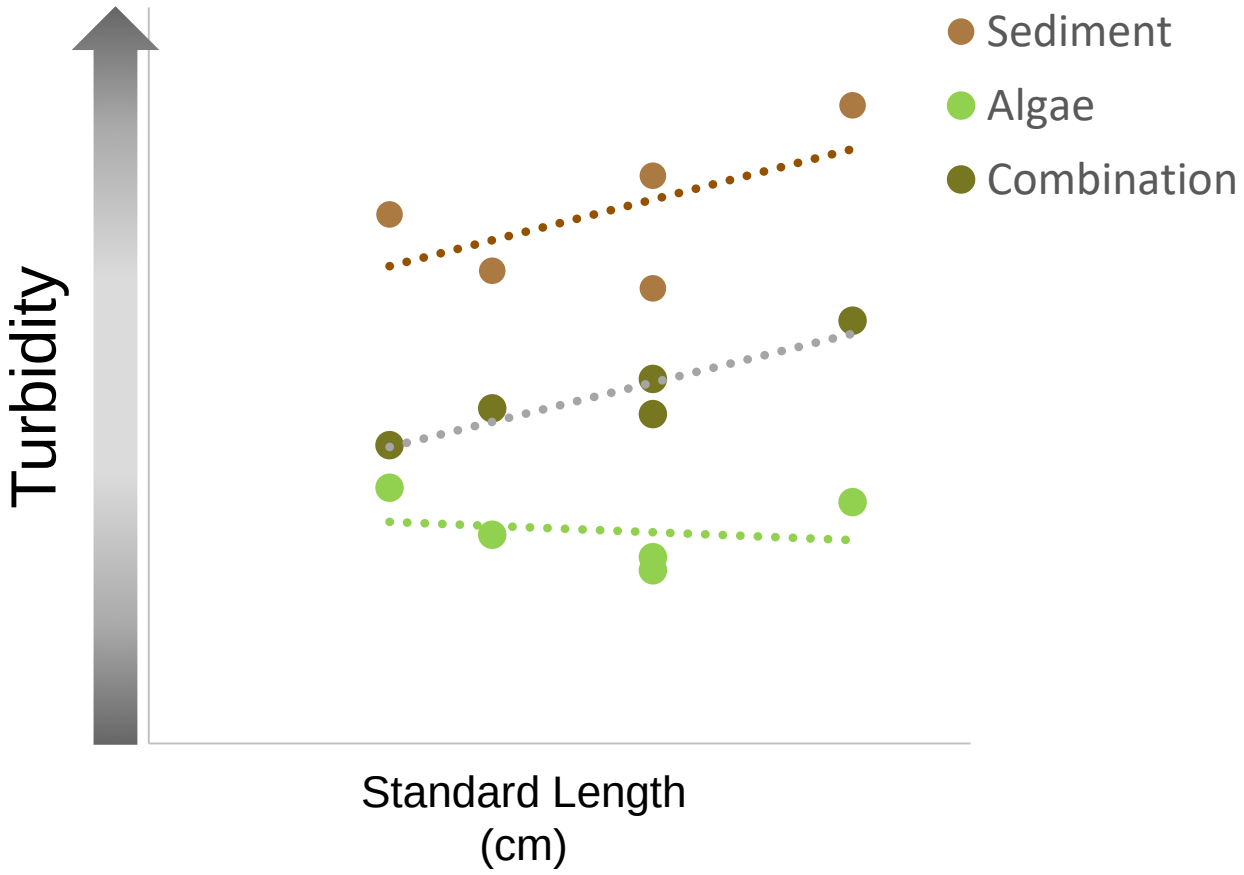


Visual detection thresholds in sedimentary turbidity were more than double that of algal turbidity.



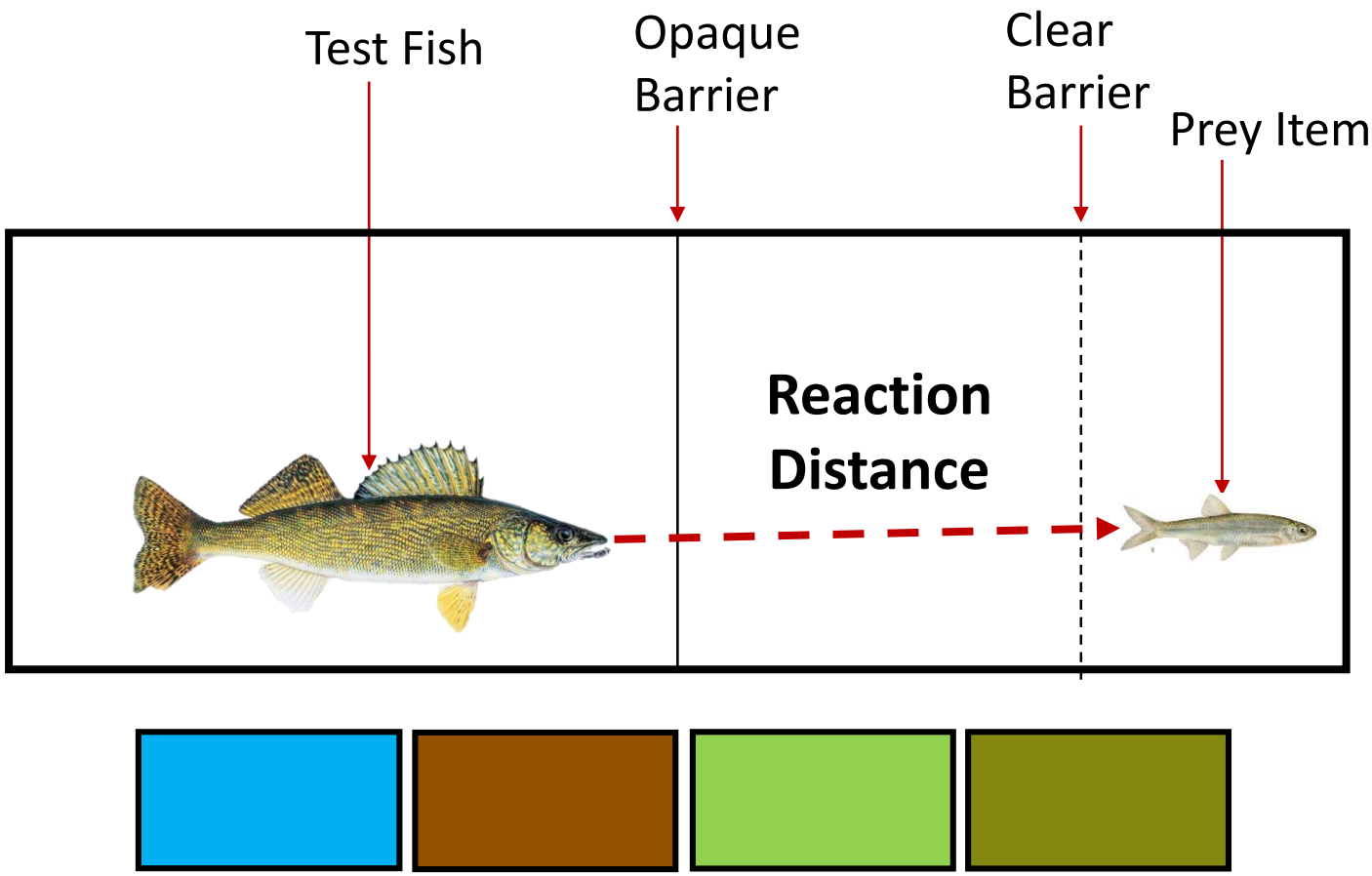
Does Size Matter?

Evidence that larger Walleye see better in sedimentary turbidity



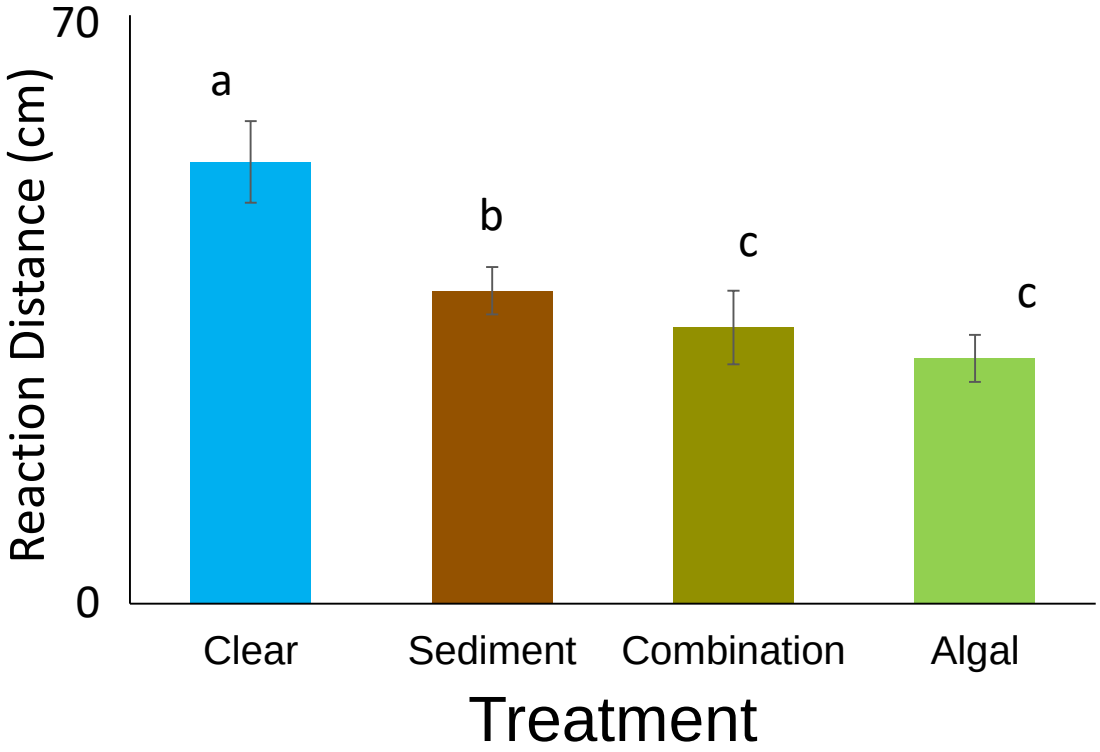
How well can Walleye detect their prey?

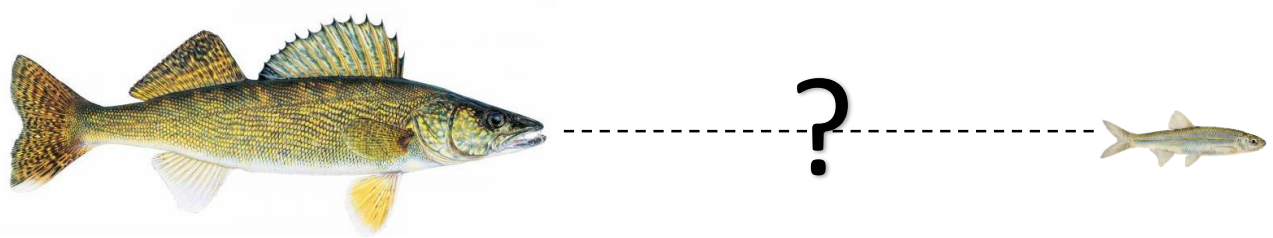
Visual Acuity = Distance which elicits a response from a visual cue



How well can Walleye see?

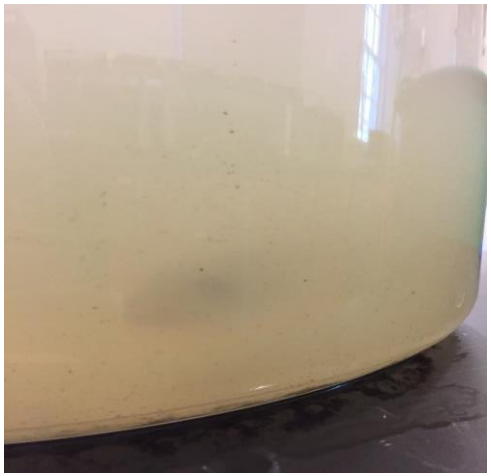
Walleye can see their prey better in clear and sedimentary turbidity than when algae is present.

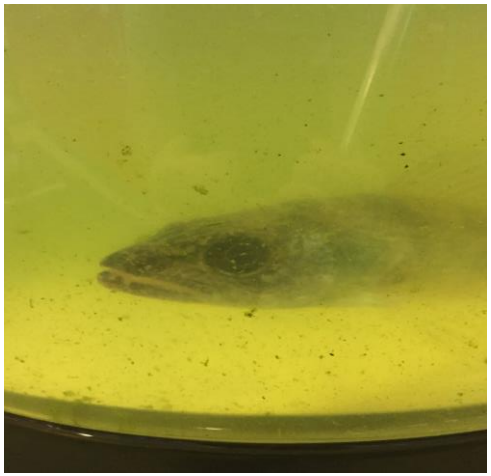




Results Summary

Sediment > **Combination** > **Algae**





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Turbidity

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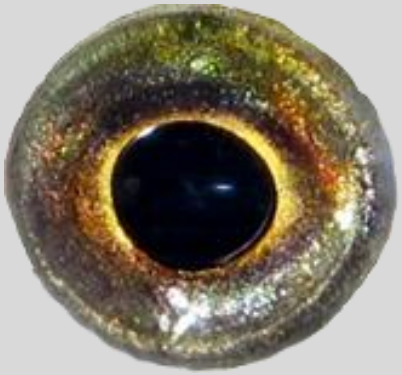

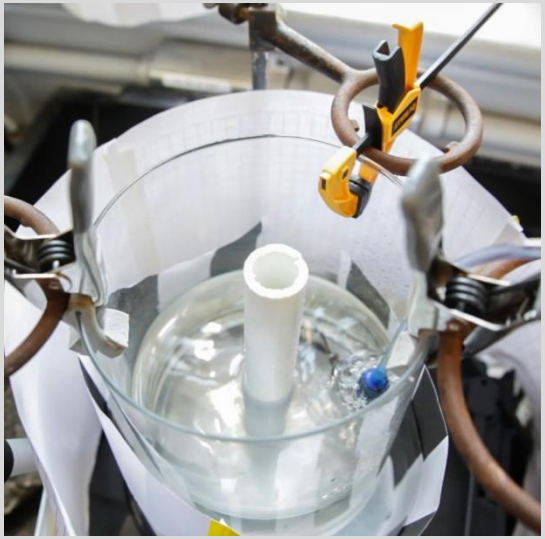

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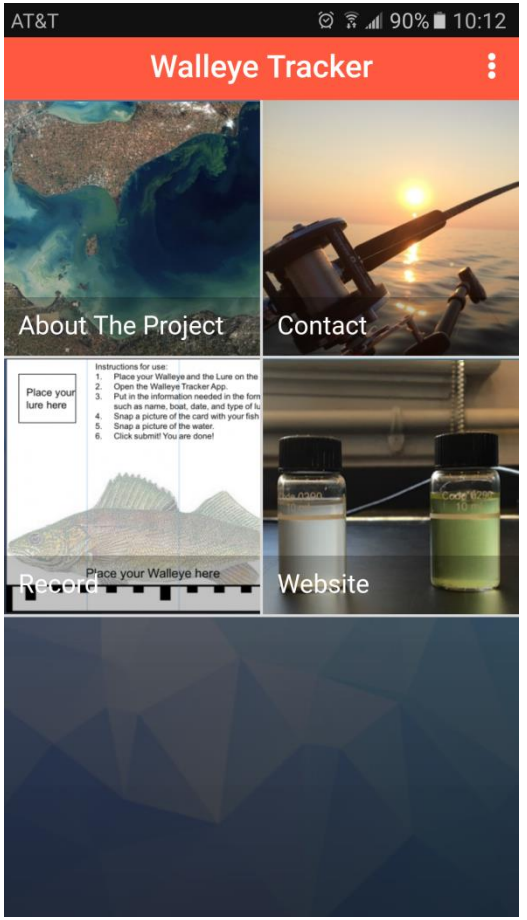

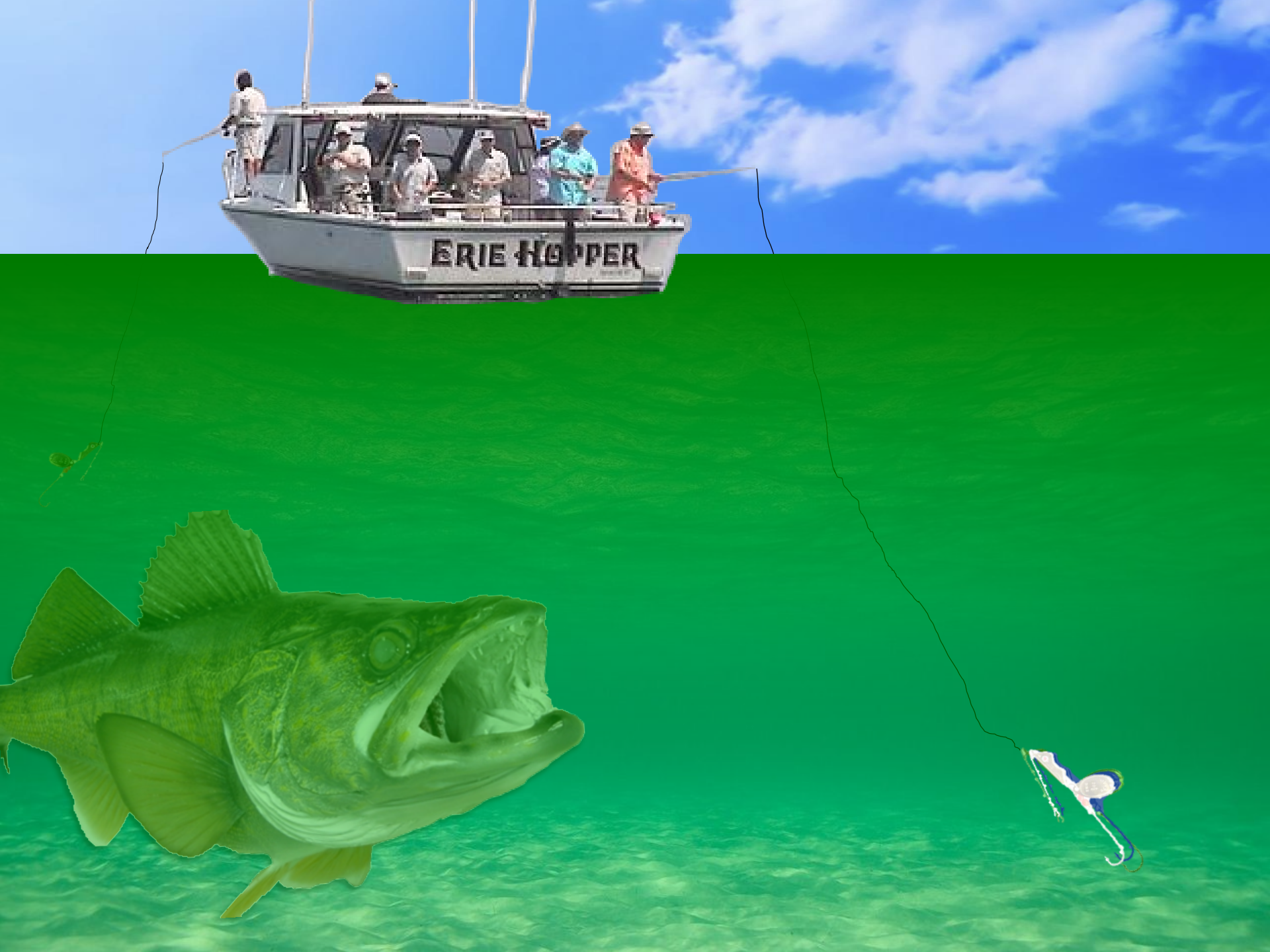
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Informational Survey

How does turbidity affect your fishing practices?

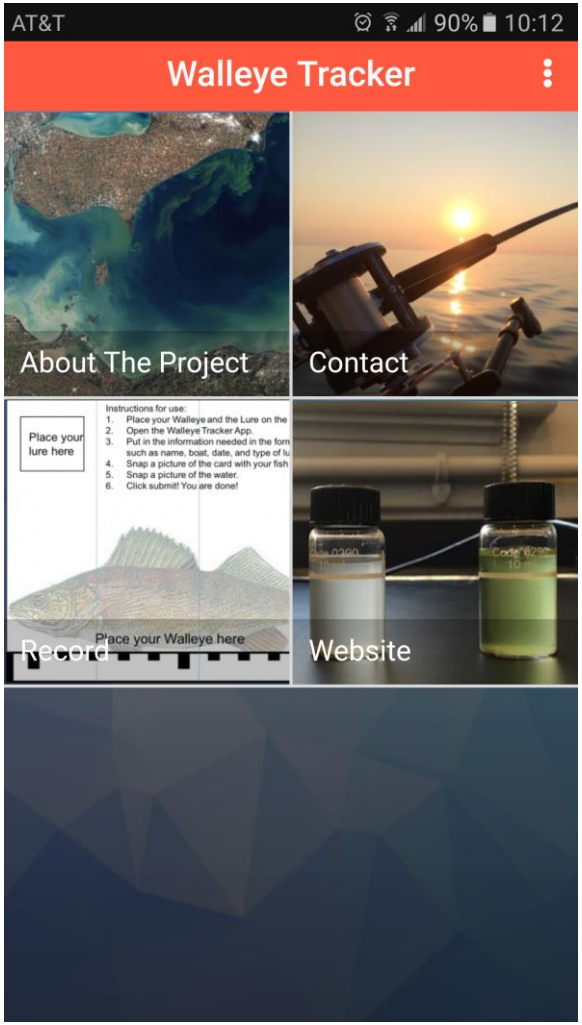
Preliminary results 2016/2017:

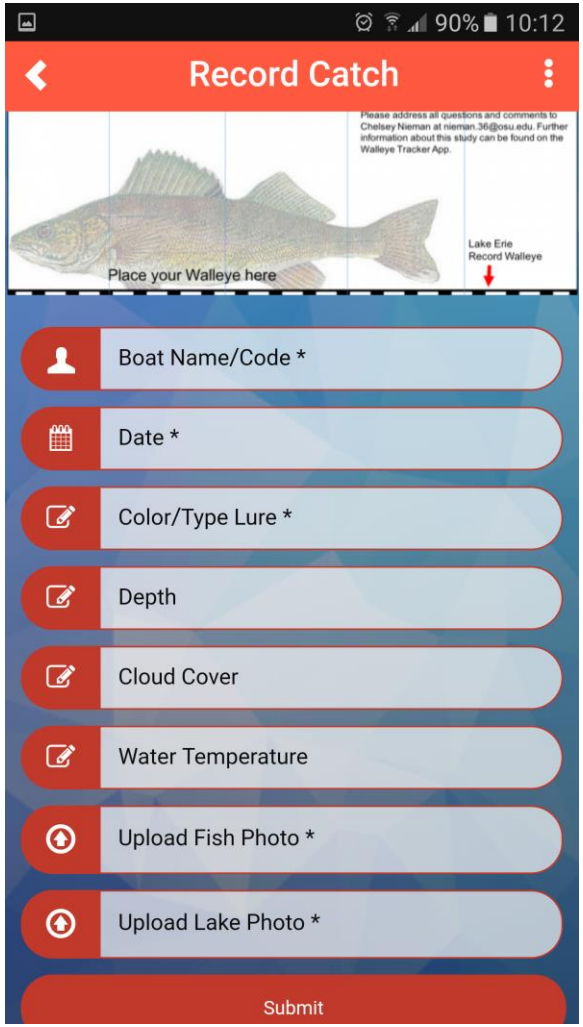
- Most fish blooms with clients, personally prefer not to
- Gold and pink lures favored for Walleye

- 42% of Captains would try different lure colors in algal blooms (no preferred color)

Walleye Tracker App

Can we determine a relationship between successful catches and water clarity?





Walleye Tracker App

17 Captains in 2017

Place your lure here

Instructions for use:

1. Place your Walleye and the Lure on the measuring sheet.
2. Open the Walleye Tracker App.
3. Put in the information needed in the form. This is information such as boat, date, and type of lure used.
4. Snap a picture of the card with your fish and your lure.
5. Snap a picture of the water.
6. Click submit! You are done!

The Ohio State University

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Ohio Sea Grant College Program

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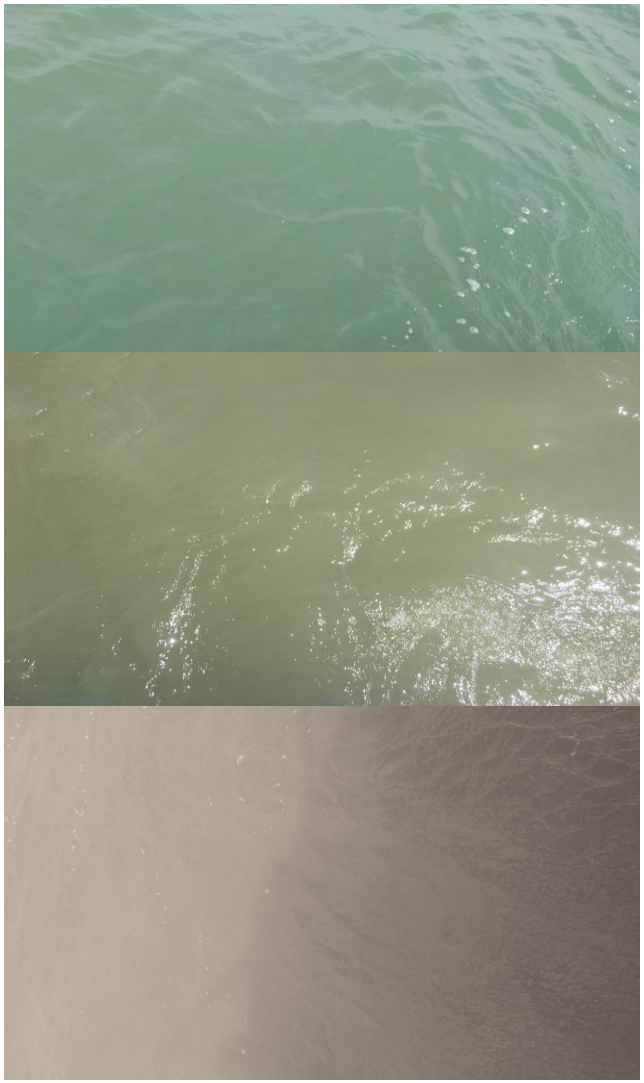
Walleye Tracker App

Preliminary Results 2017



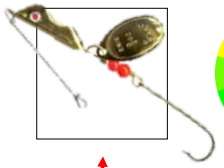
GOLD PINK

PURPLE

GOLD YELLOW

Walleye Tracker App

Feedback



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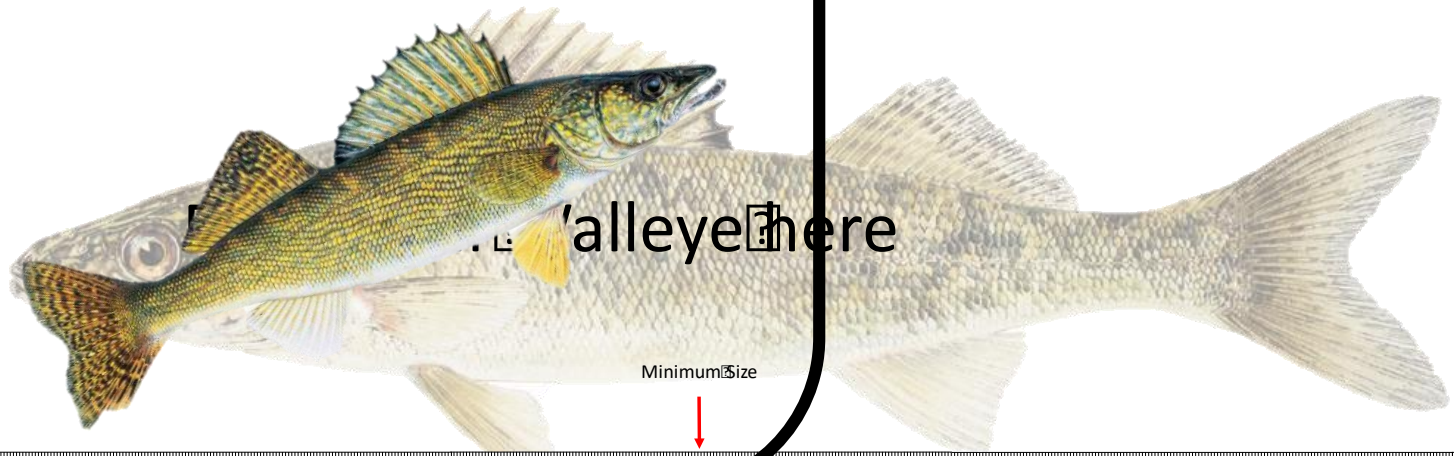

Minimum Size

Lake Erie Record Walleye

Walleye Tracker App

- Sign-up sheets
- Measuring cards
- App instructions

Can fish see the bait on the hook?

Thank you!