Hypoxia Focus Group Survey Results

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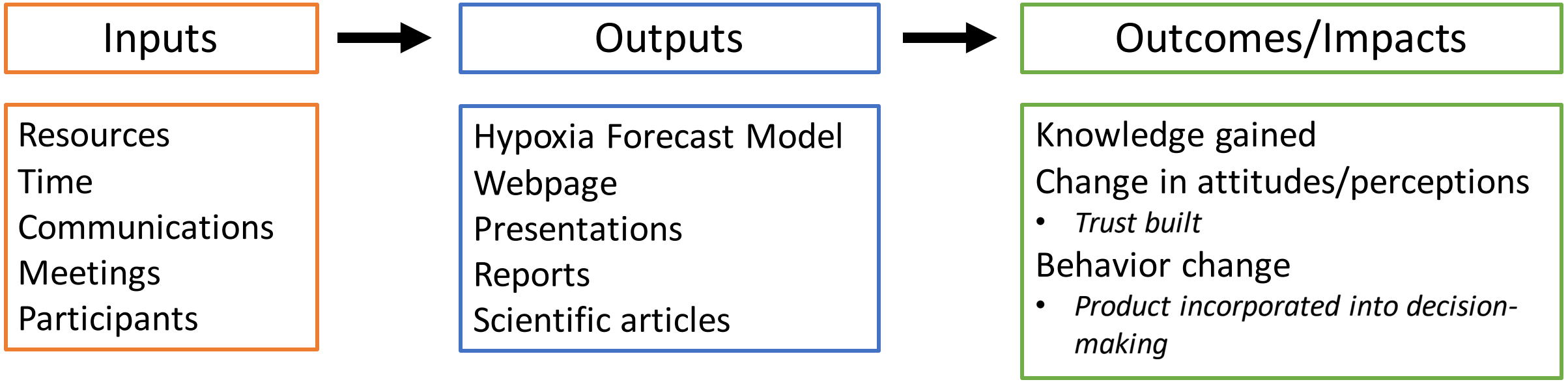
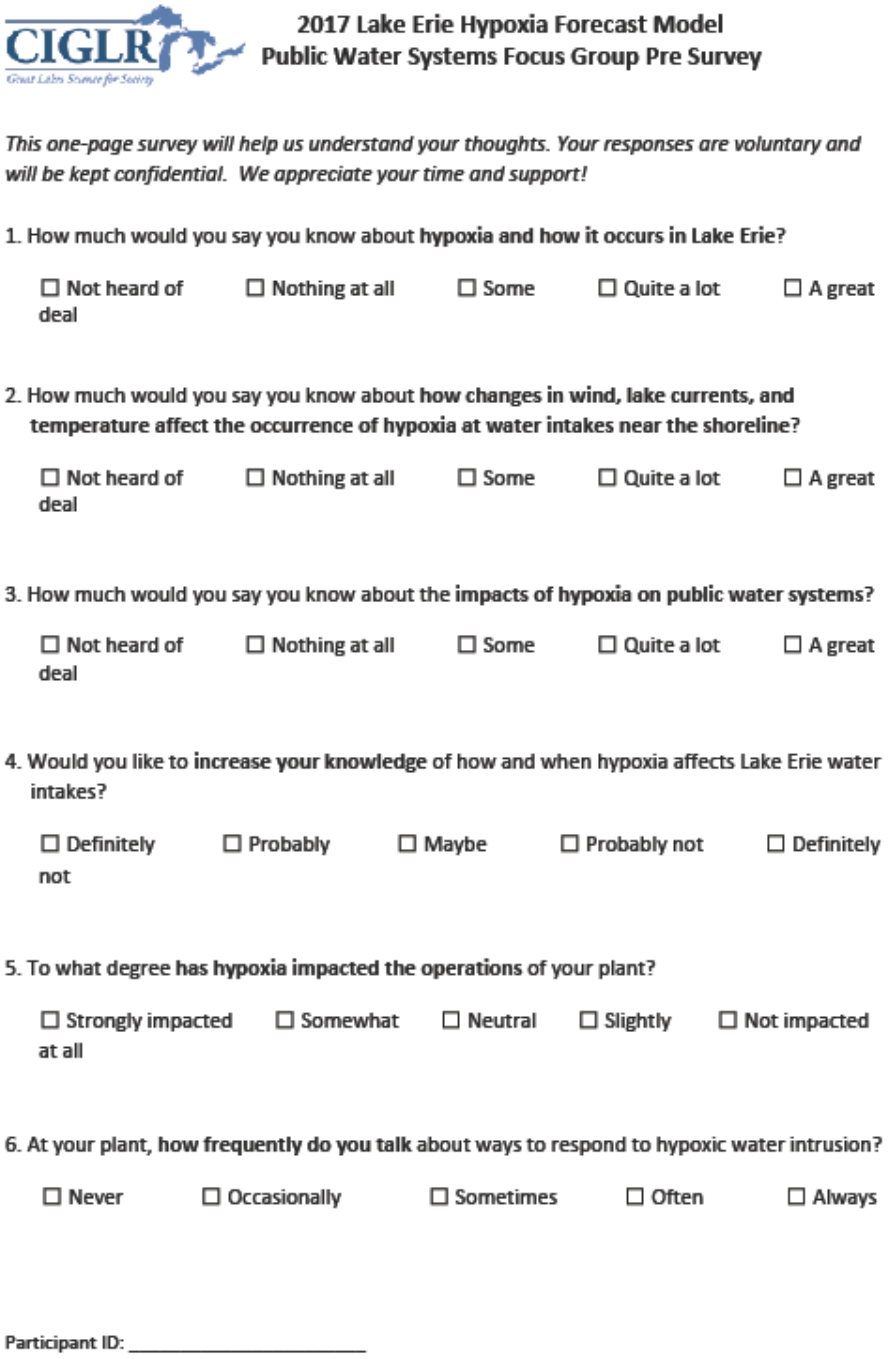
Project Evaluation: Logic Model



Hypoxia Focus Group Survey

- Pre & post surveys conducted as written questionnaires using Likert-type scale

- 31 respondents
  - Sample size: 32 participants in 9 focus groups for plants that draw water from Lake Erie's Central Basin
  - Missing post-survey data from 1 respondent, pre-survey data of respondent omitted from analysis (n=31)



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2017 Lake Erie Hypoxia Forecast Model
Public Water Systems Focus Group Pre Survey

This one-page survey will help us understand your thoughts. Your responses are voluntary and will be kept confidential. We appreciate your time and support!

1. How much would you say you know about **hypoxia and how it occurs in Lake Erie?**

☐ Not heard of deal ☐ Nothing at all ☐ Some ☐ Quite a lot ☐ A great

2. How much would you say you know about **how changes in wind, lake currents, and temperature affect the occurrence of hypoxia at water intakes near the shoreline?**

☐ Not heard of deal ☐ Nothing at all ☐ Some ☐ Quite a lot ☐ A great

3. How much would you say you know about the **impacts of hypoxia on public water systems?**

☐ Not heard of deal ☐ Nothing at all ☐ Some ☐ Quite a lot ☐ A great

4. Would you like to **increase your knowledge** of how and when hypoxia affects Lake Erie water intakes?

☐ Definitely ☐ Probably ☐ Maybe ☐ Probably not ☐ Definitely not

5. To what degree **has hypoxia impacted the operations** of your plant?

☐ Strongly impacted ☐ Somewhat ☐ Neutral ☐ Slightly ☐ Not impacted at all

6. At your plant, **how frequently do you talk** about ways to respond to hypoxic water intrusion?

☐ Never ☐ Occasionally ☐ Sometimes ☐ Often ☐ Always

Participant ID: _____

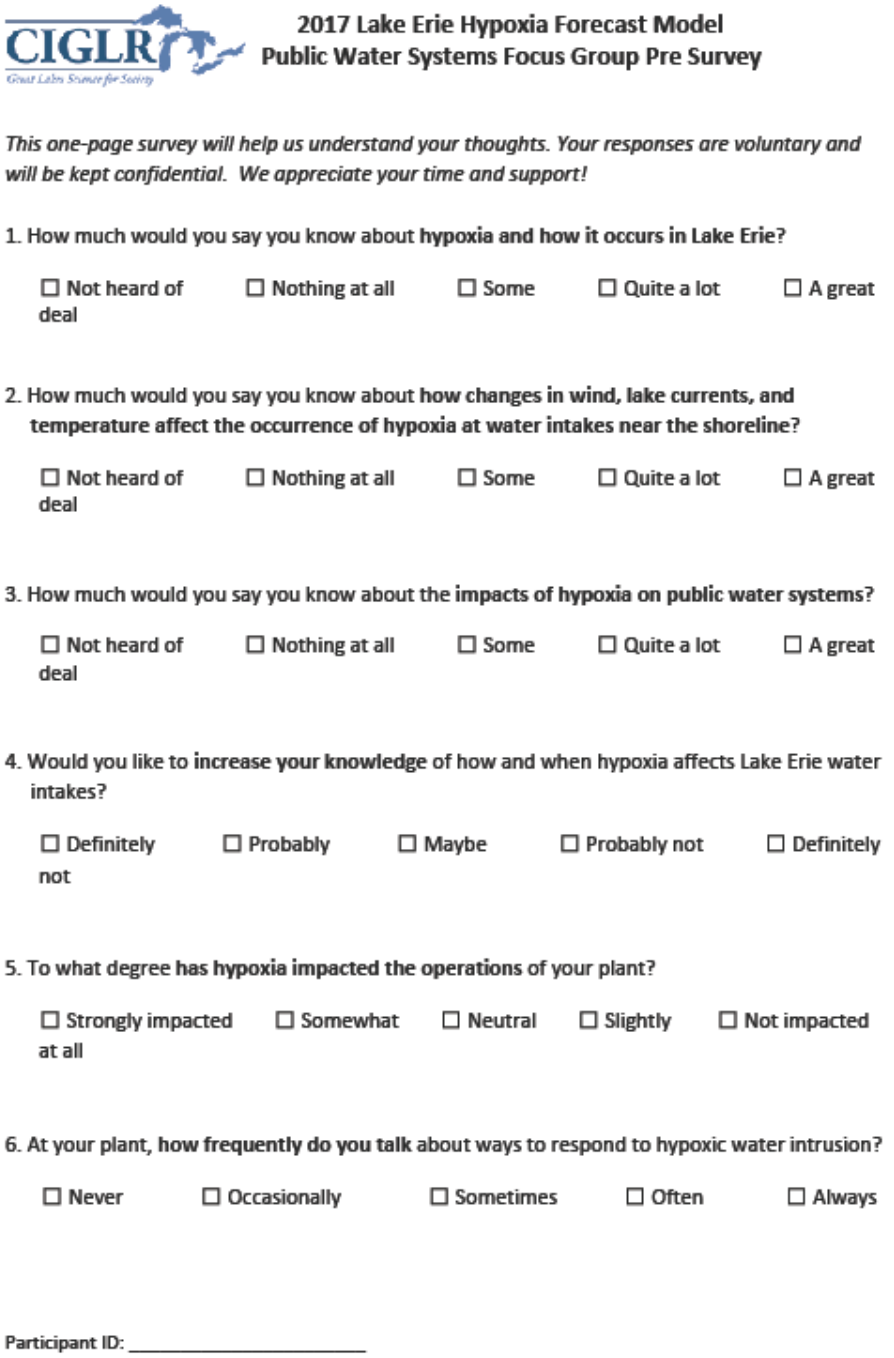
Summary of Survey Results

- Metrics:
  - **Knowledge** of hypoxia in Lake Erie (Q1)
  - **Knowledge** of lake processes that create hypoxia (Q2)
  - **Knowledge** of impact of hypoxia on drinking water treatment plants (Q3)
  - **Attitude** toward increasing knowledge of hypoxia's impact on drinking water treatment plants (Q4)
  - **Behavior** as an intention to use the hypoxia forecast to inform plant operations (Q7)

Knowledge

Attitude

Behaviors



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Participant ID: _____

Summary of Hypoxia Focus Group Survey Results

Results

- Participant **knowledge increased** in 3 areas as a result of participation in focus groups: 1) General knowledge of hypoxia; 2) Knowledge of lake processes that create hypoxia, 3) Hypoxia's impact on plant operations
- Participant **intention to use the hypoxia forecast increased** after participation in the focus groups
- Participants have **a high desire to learn more about the impact of hypoxia** on drinking water treatment plants

Survey Questions

Q1. How much would you say you know about **hypoxia and how it occurs in Lake Erie**?

Not head of Nothing at all Some Quite a lot A great deal

Increased knowledge of hypoxia

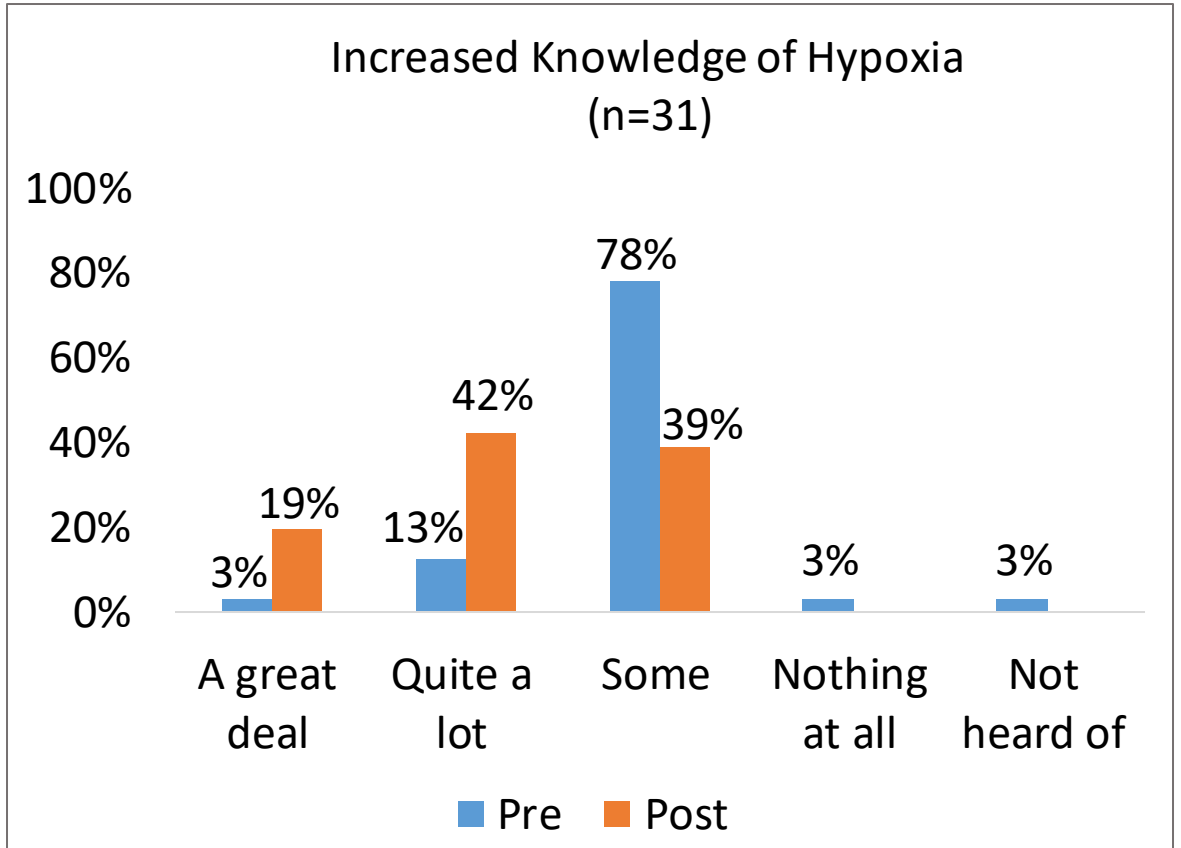
<u>Pre-Survey:</u>

- Most participants said they knew “some” or nothing about hypoxia in Lake Erie (84%)
- Only a few said they knew a lot (16%)

<u>Post-Survey:</u>

- Participants who said they knew a lot about hypoxia increased to 61%.

Participant knowledge about hypoxia in Lake Erie increased significantly after participation in the focus group (paired t(30)=4.79, p=0.00).



Paired Sample T-Test					
Mean diff.	Std. dev.	Std. error	t	df	Sig. (1-tailed)
0.7096	0.8243	0.8243	4.7931	30	0.000

Survey Questions

Q2. How much would you say you know about **how changes in wind, lake currents, and temperature affect the occurrence of hypoxia at water intakes near the shoreline**?

Not head of | Nothing at all | Some | Quite a lot | A great deal

Increased knowledge of lake processes that create hypoxia

<u>Pre-Survey:</u>

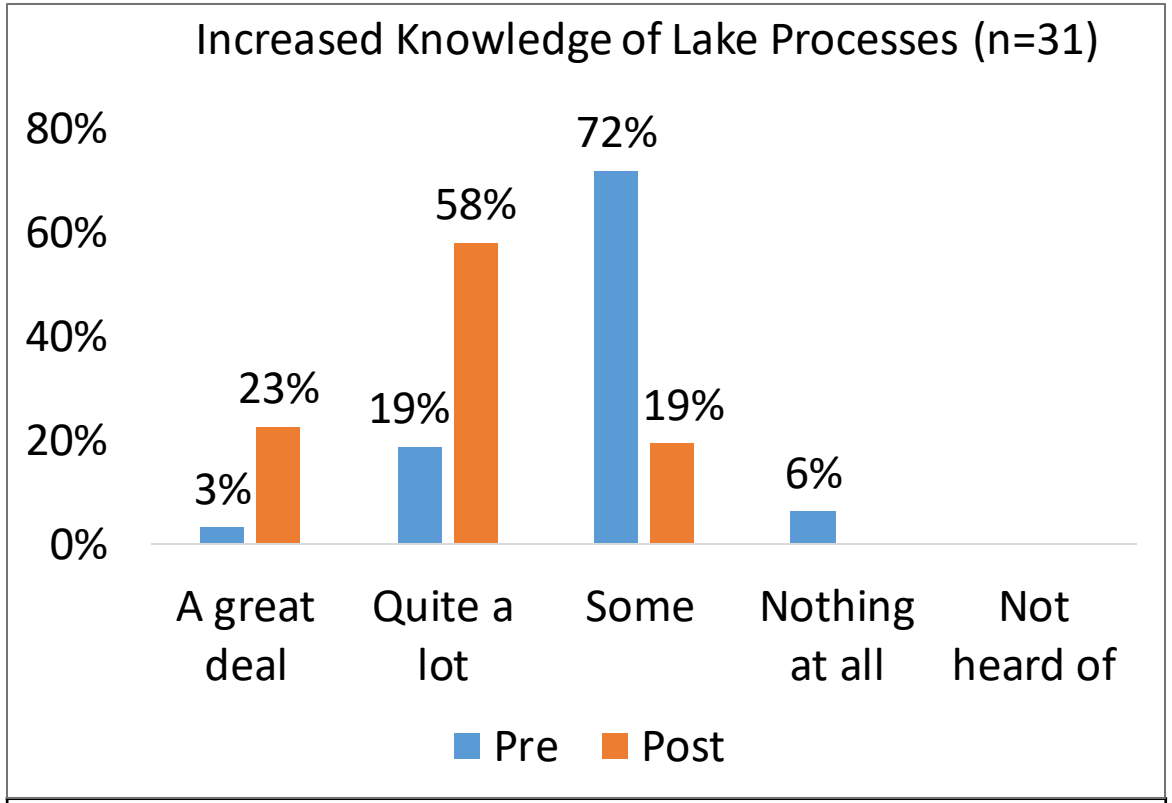
- Most participants said they knew “some” about Lake Erie’s physical processes (72%).
- Only 22% said they knew a lot

<u>Post-Survey:</u>

- Participants who said they knew a lot about lake processes increased to 81%.

Participant knowledge about the lake processes that create hypoxia increased significantly after participation in the focus group (paired t(30)=6.78, p=0.00).

This was the area of greatest knowledge gain (Mean diff.=0.8387).



Paired Sample T-Test					
Mean diff.	Std. dev.	Std. error	t	df	Sig. (1-tailed)
0.8387	0.6878	0.1235	6.7890	30	0.000

Survey Questions

Q3. How much would you say you know about **the impact of hypoxia on public water systems**?

Not head of	Nothing at all	Some	Quite a lot	A great deal

Increased knowledge of hypoxia's impact on plants

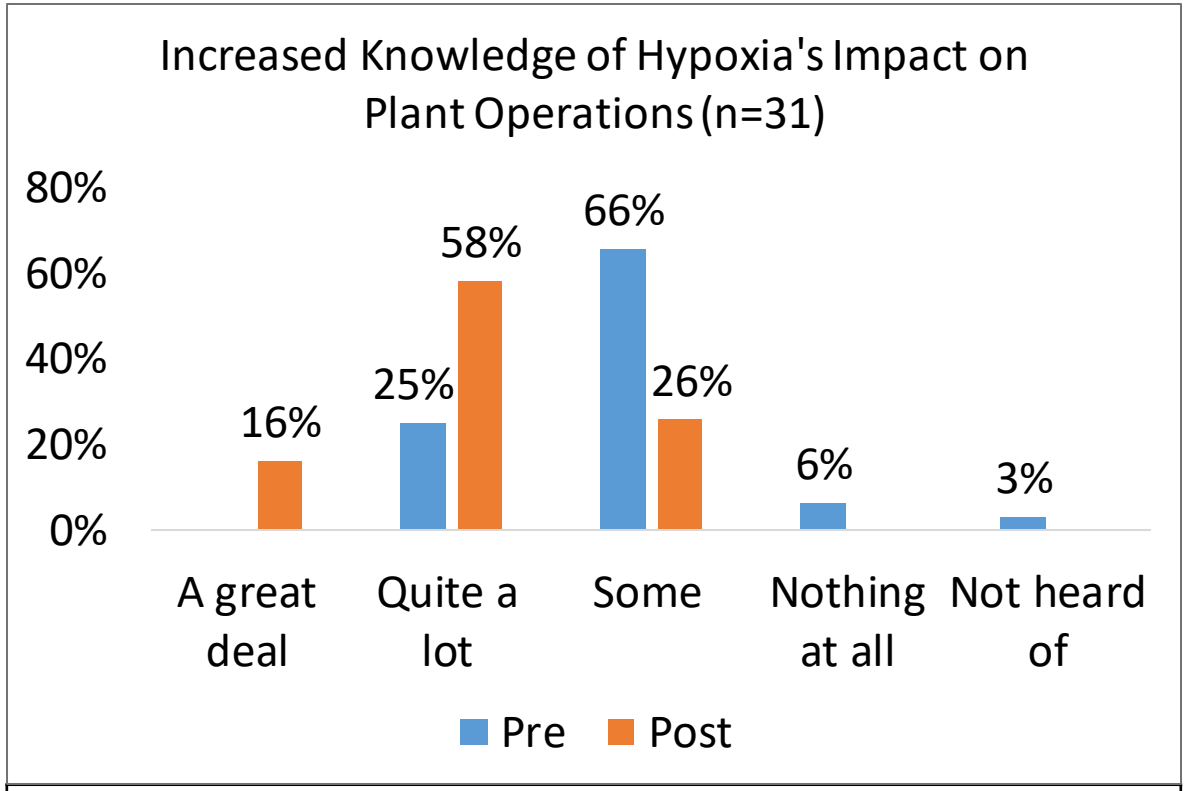
Pre-Survey:

- Most participants said they knew "some" about the impact of hypoxia on water plants (66%).
- Only 25% said they knew a lot

Post-Survey:

- Participants who said they knew a lot about the impact of hypoxia increased to 74%.

Participant knowledge about the impact of hypoxia on plant operations increased significantly after participation in the focus group (paired t(30)=4.68, p=0.00).



Paired Sample T-Test					
Mean diff.	Std. dev.	Std. error	t	df	Sig. (1-tailed)
0.7741	0.9204	0.1653	4.6828	30	0.000

Survey Questions

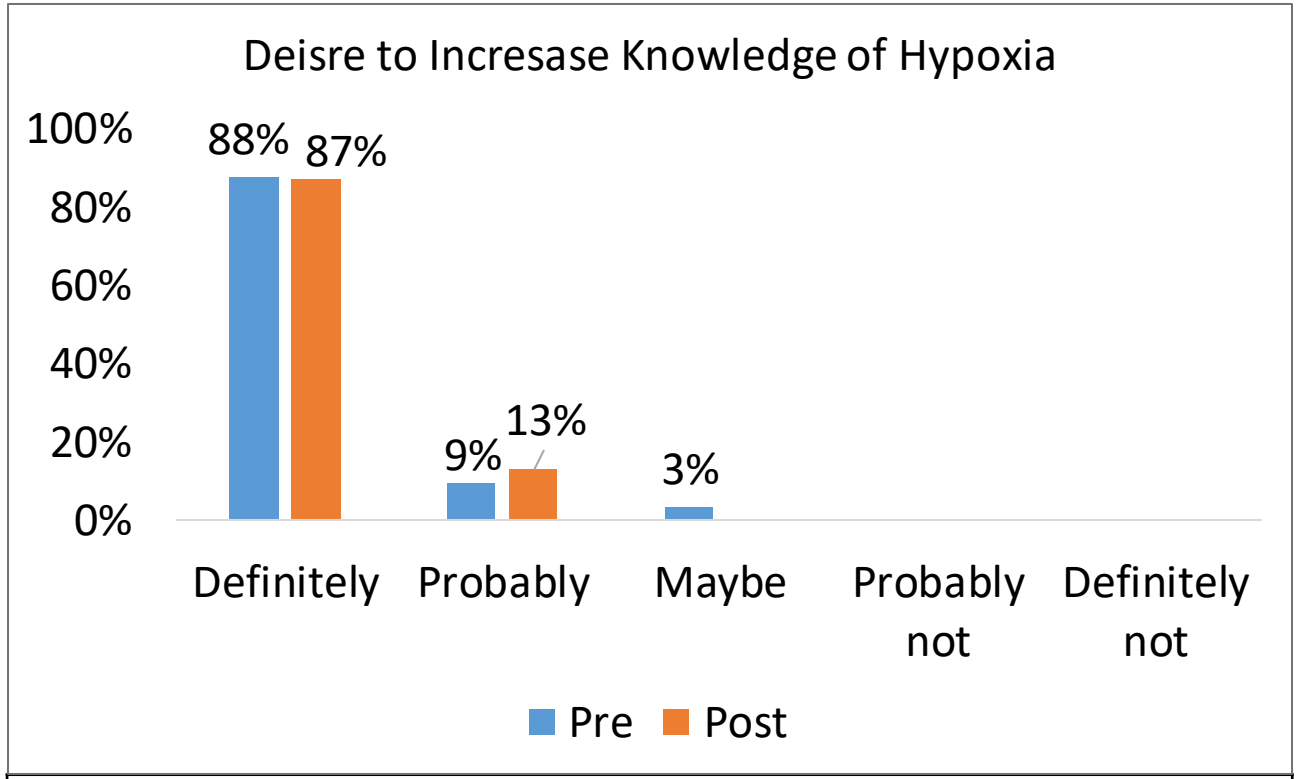
Q4. Would you like to **increase your knowledge** of how and when hypoxia affects Lake Erie water intakes?

Definitely Probably Maybe Probably Not Definitely Not

High willingness to increase knowledge of hypoxia's impact on treatment plants

- In both Pre and Post Surveys, the majority of participants indicated that they would like to learn more about the impact of hypoxia on treatment plants (Pre=88%, Post=87%).

Participant desire to learn more about the impact of hypoxia on water treatment plants did NOT significantly change after participation in the focus group (paired t(30)=0.37, p=0.71).



Paired Sample T-Test					
Mean diff.	Std. dev.	Std. error	t	df	Sig. (2-tailed)
0.0322	0.4819	0.0865	0.3726	30	0.7120

Survey Questions

Q7. If a forecast could provide a few days advance notice of hypoxic events, **how likely would you be to use the information** in plant operations?

Definitely Probably Maybe Probably Not Definitely Not

Increased intention to use the hypoxia forecast

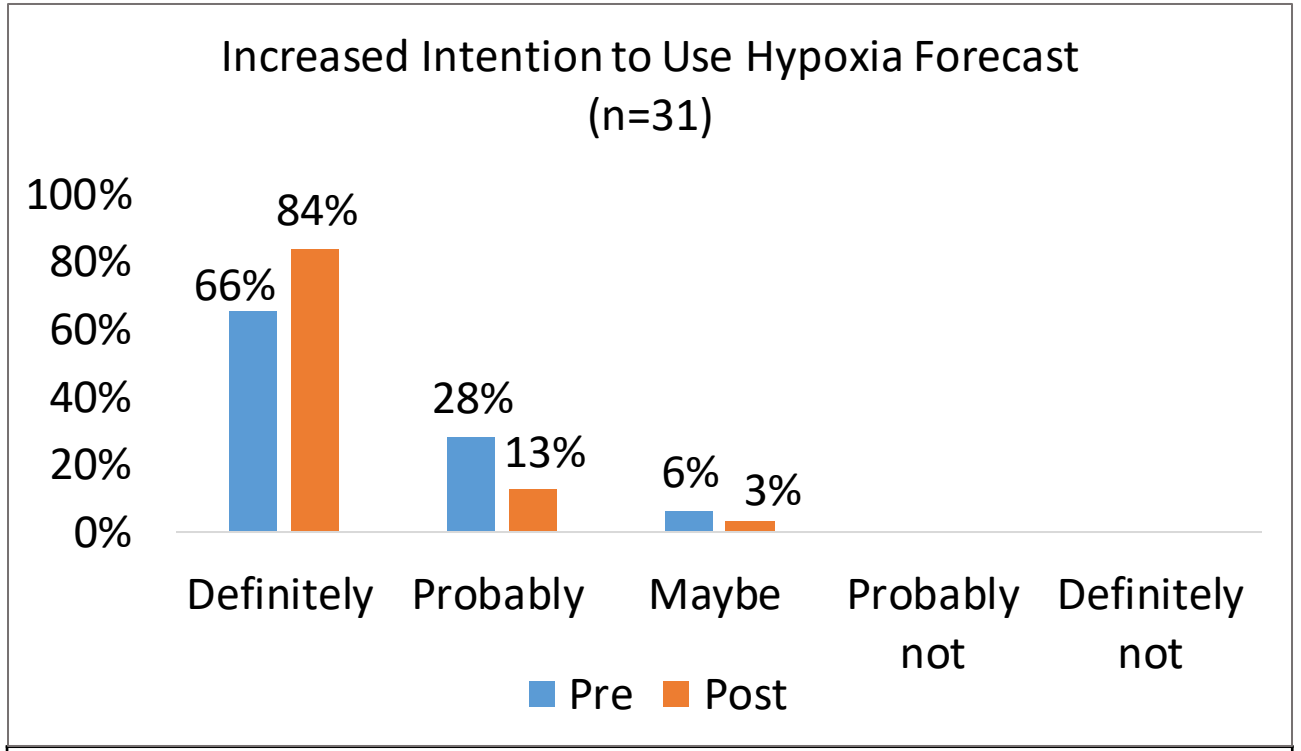
Pre-Survey:

- 66% of participants said they would definitely use the hypoxia forecast
- 34% said they would “probably” or “maybe” use it

Post-Survey:

- 84% of participants said they would definitely use the hypoxia forecast

Participant intention to use the hypoxia forecast increased significantly after participation in the focus group (paired t(30)=2.25, p=0.03).



Paired Sample T-Test					
Mean diff.	Std. dev.	Std. error	t	df	Sig. (2-tailed)
0.1935	0.4774	0.0857	2.2570	30	0.0314

Future Work

- Survey data represents short-term results.

- To gather longer-term data results, survey will be repeated during second round of focus groups conducted two years after the original data collection period.

- Along with metrics for changes in **knowledge**, **attitude**, & **behavior** (intention to use the forecast); metrics for changes in **behavior** (preparation for hypoxic events) & **attitude** (perception of hypoxia's impact on their plant) will also be measured & reported after participants have an opportunity to use the hypoxia forecast.