

Management of Boat Gas Constituents in Whitefish Lake: 20 Years Later





What is Whitefish Lake Institute – why BTEX?

- The Whitefish Lake Institute is a nonprofit which aims to protect Whitefish Lake and local tributaries
- Studying BTEX was one of WLI's first projects in 2005
- Now, 20 years later we repeated the study to see what has changed

What are Boat Gas Constituents?

BTEX – benzene, toluene, ethylbenzene and xylene

Main source of BTEX in Whitefish Lake is boat gas

BTEX can be carcinogenic among various other negative health effects

BTEX is regulated in drinking water (MCL 5 ug/L benzene, 1,000 ug/L toluene, 700 ug/L ethylbenzene 10,000 ug/L total xylenes)

Sampling locations

A) Mid-lake reference near Hellroaring point

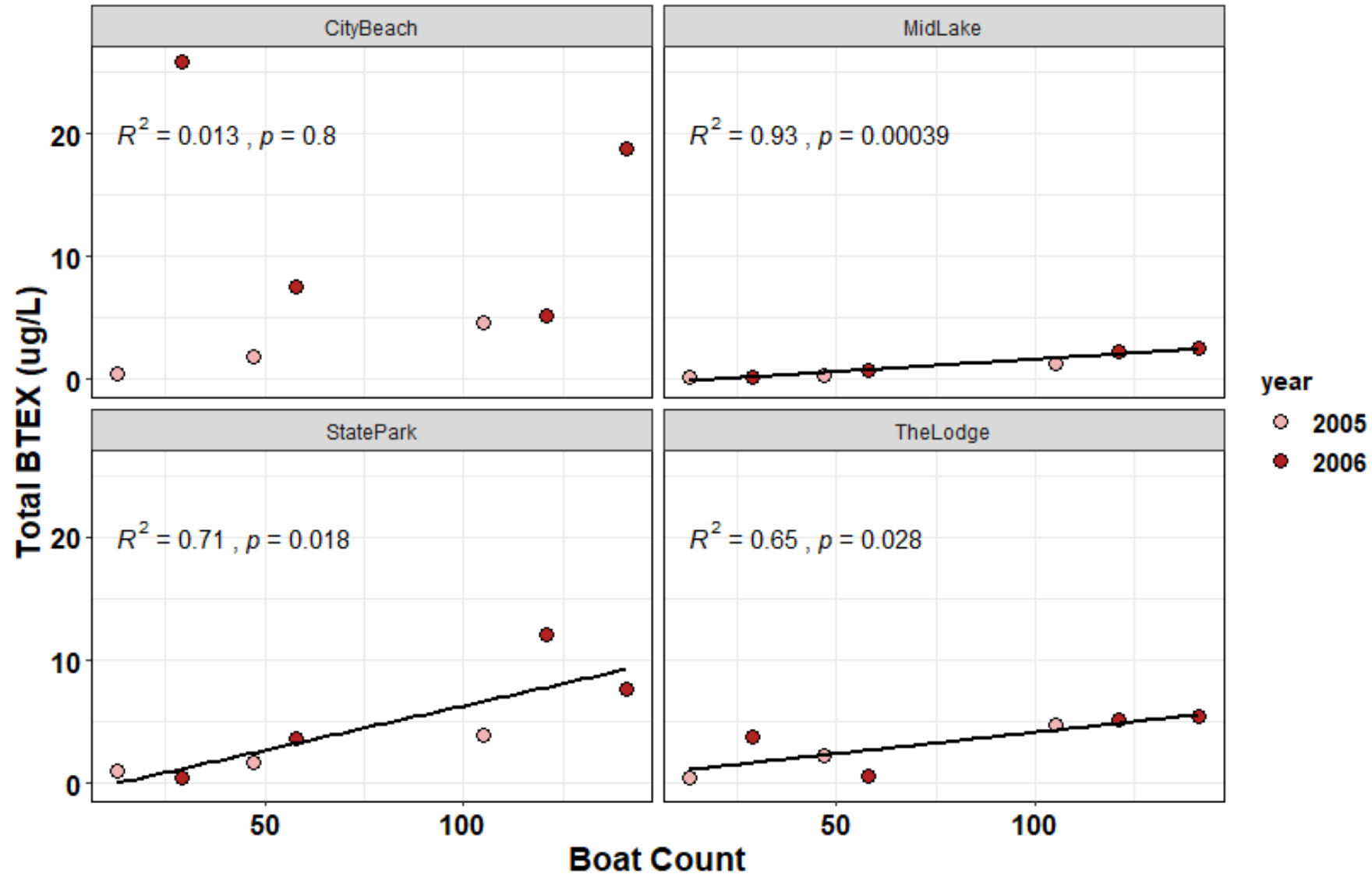
B) State Park boat launch at dog bay—between the dock and swimming area

C) The Lodge at Whitefish Lake boat dock at Monk's bay

D) City of Whitefish boat launch at city beach—between the dock and swimming area



What did the first study show?



Actions Taken after 2005/2006 BTEX Study

- Result of 2005 study was a gasoline interceptor trench in boat ramp at city beach



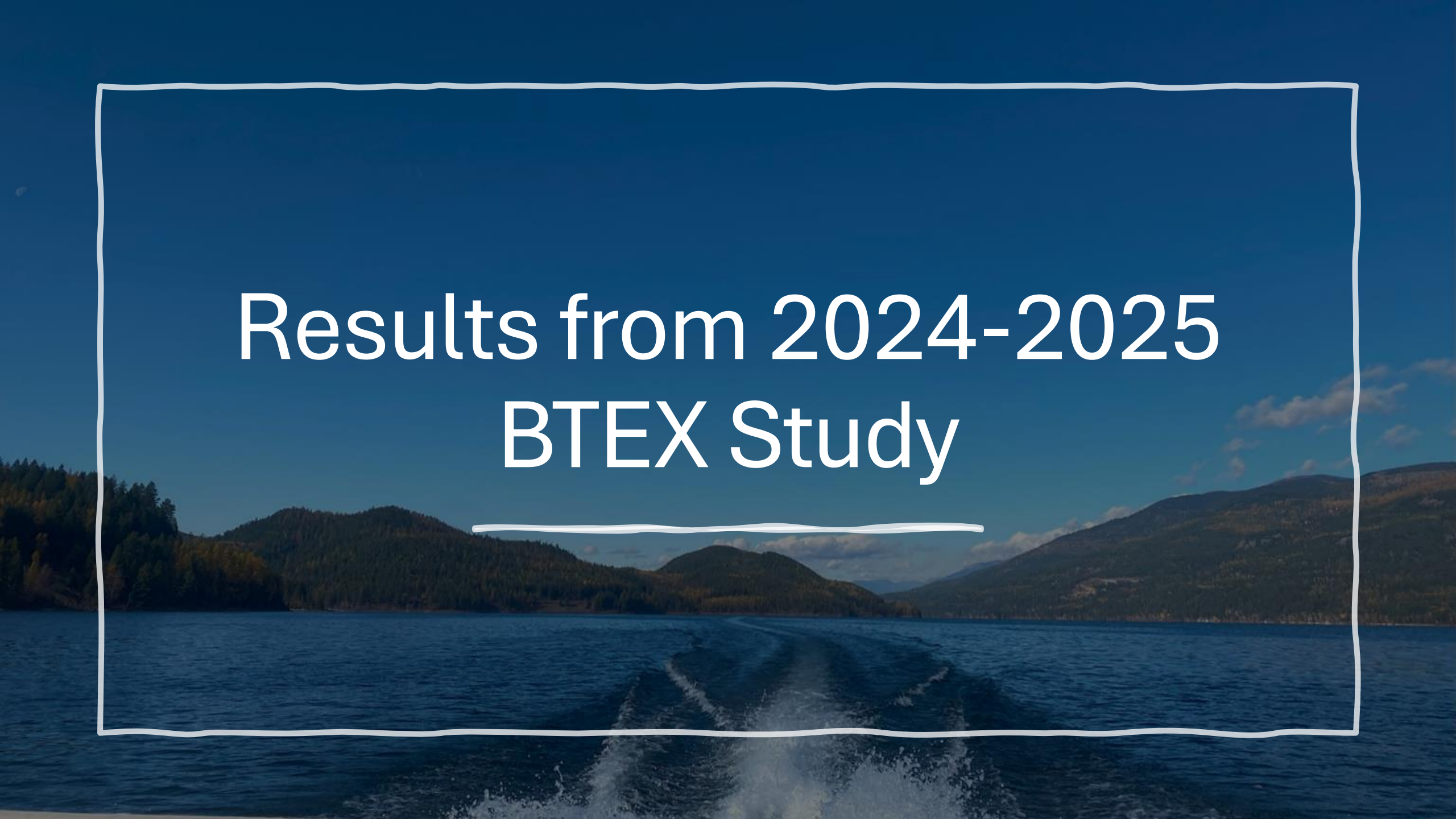
Main Questions

Have BTEX levels
increased since 2005?

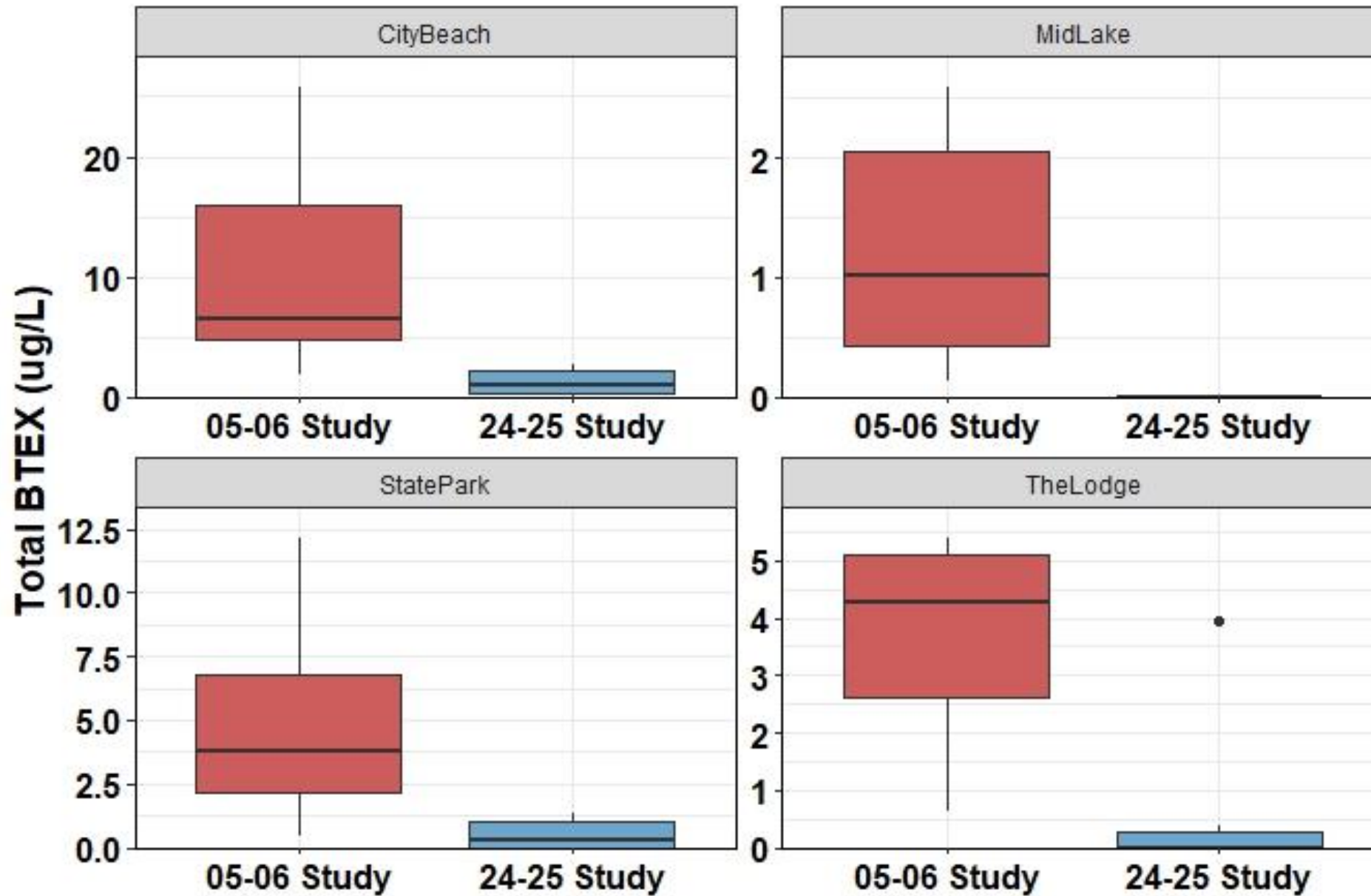
Is the interceptor trench
effective at preventing
BTEX in the water near city
beach?

How have dock and boat
numbers changed since
2005?

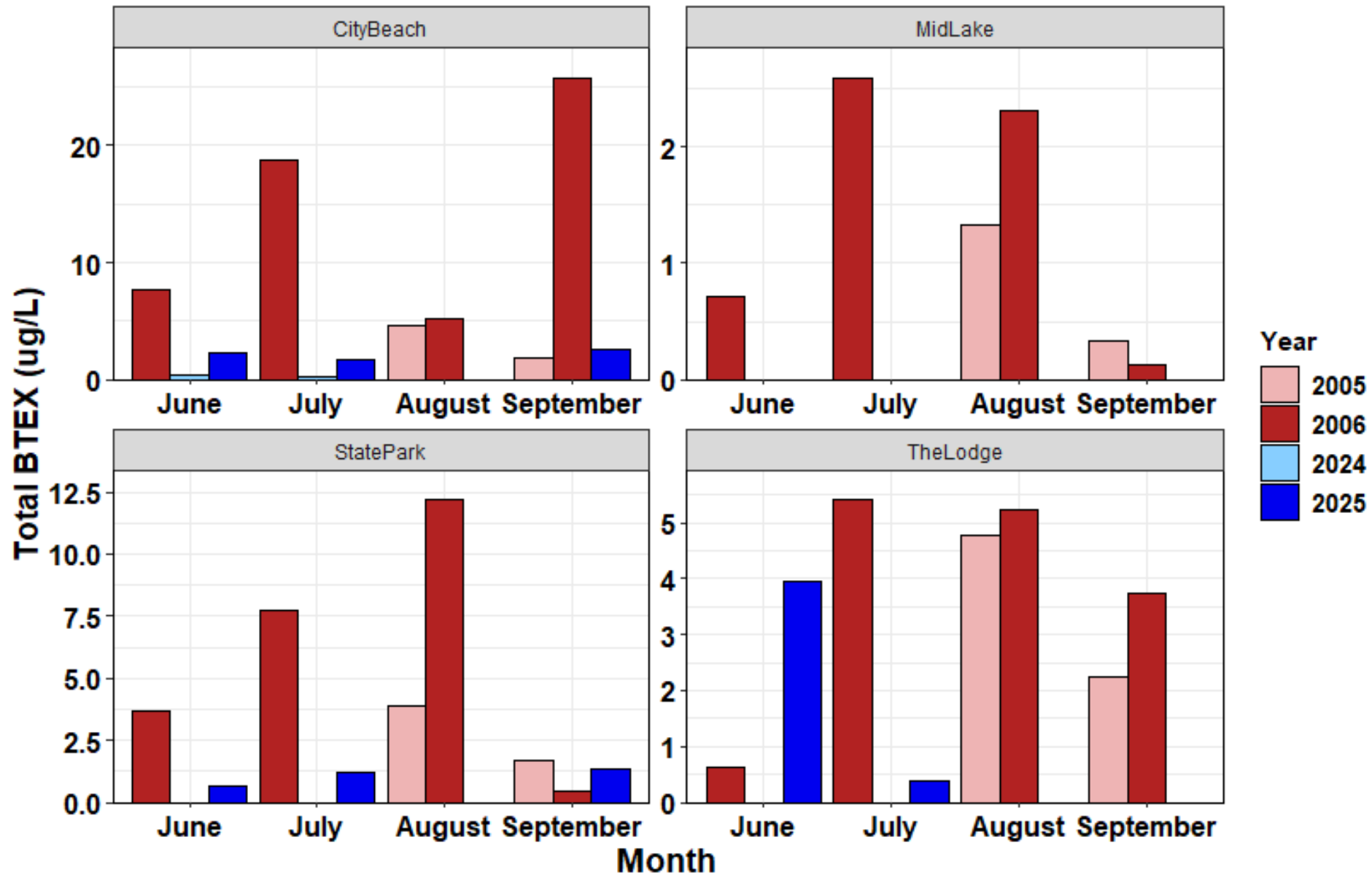
Are BTEX levels near city
beach now more
correlated with boat
numbers/or just generally
lower

The background of the slide is a scenic photograph of a large body of water, likely a lake or a wide river. In the foreground, the white, frothy wake of a boat moving through the water is visible, creating a sense of motion. The water is a deep blue. In the background, there are several layers of forested mountains under a clear, bright blue sky with a few wispy clouds. The entire scene is framed by a white, hand-drawn style border.

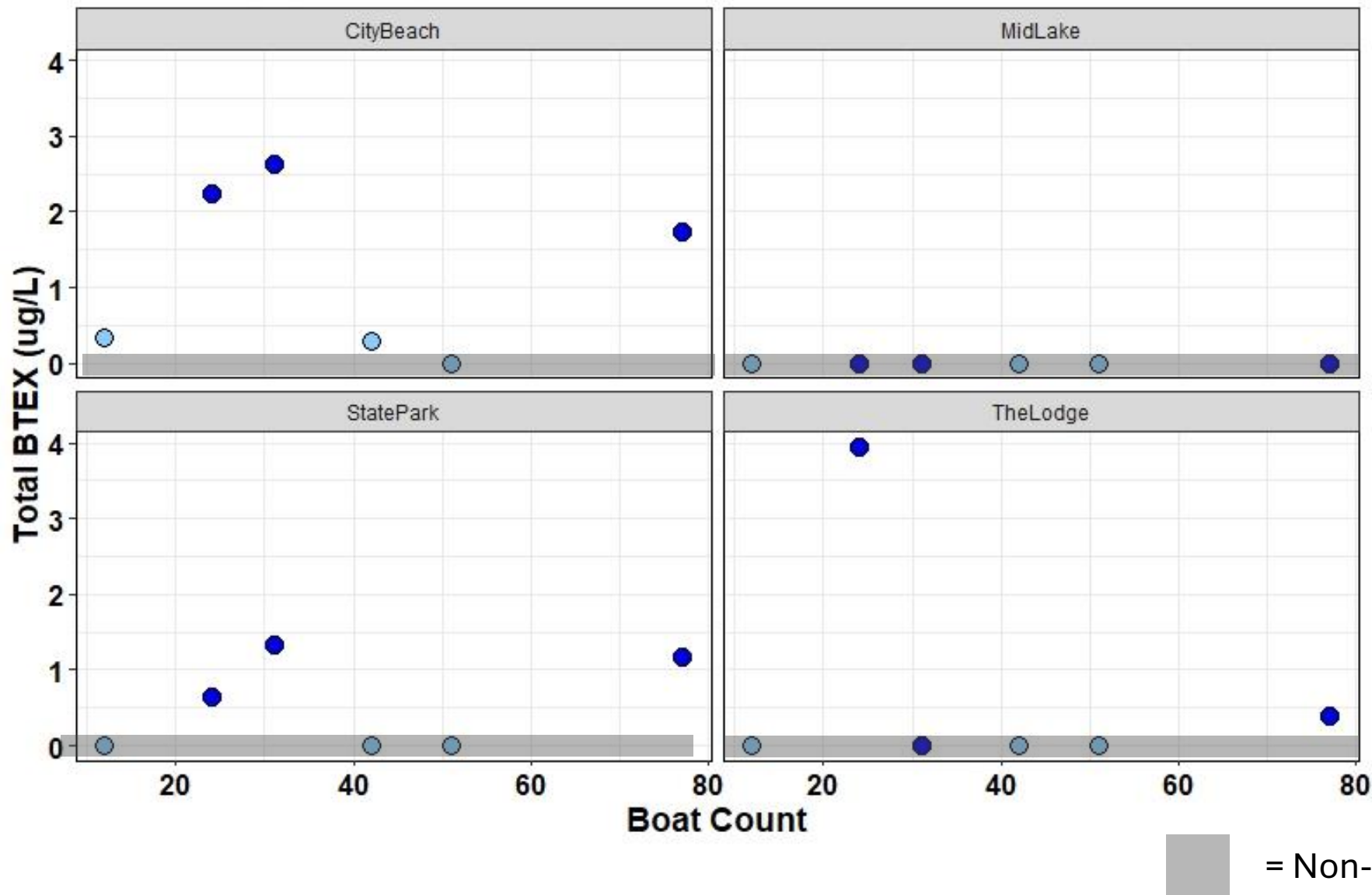
Results from 2024-2025 BTEX Study



Whitefish
Lake BTEX
levels are
lower



Whitefish
Lake BTEX
levels are
lower



BTEX levels are
no longer
correlated with
boat count at
any site

2024
2025

= Non-detects

BTEX Study Main Takeaways

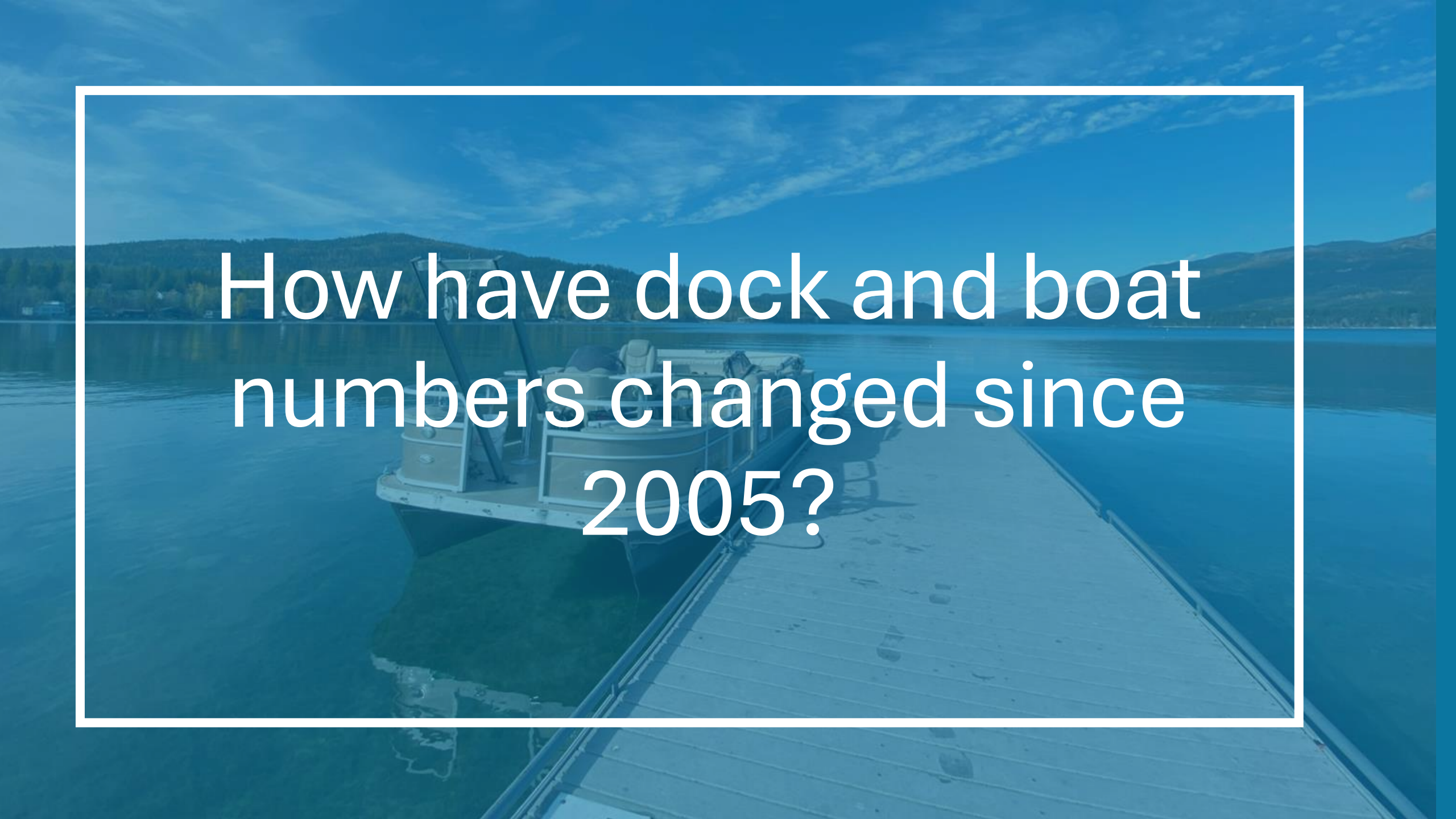
Overall, BTEX levels are much lower and there is no longer BTEX detected at the mid-lake site

- The City Beach interceptor trench is helping keep BTEX out of the lake
- Boat motors are now much more efficient and less likely to cause contamination, two stroke motors are much less common

BTEX level is no longer correlated with boat count

- Having detectable levels at sampling sites of BTEX is now much more rare and more likely due to an older boat, leaking motor, or incorrect use of the city beach drainage trench.
- A linear regression is an oversimplification of how BTEX is processed and moved through the natural environment, BTEX processing is influenced by weather, water temperature etc.

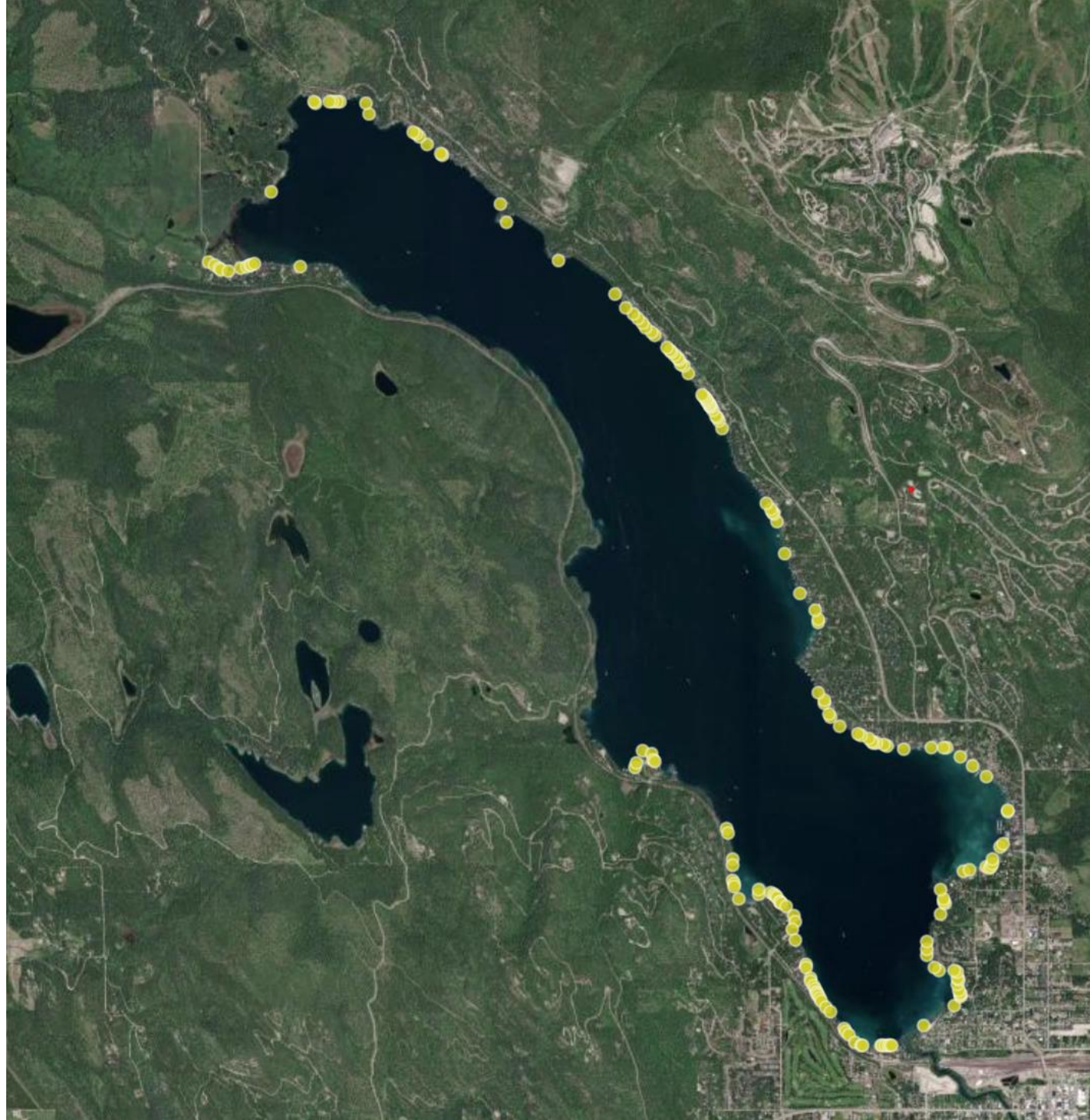
Woody Weekend at The Lodge may have an impact on BTEX levels



How have dock and boat
numbers changed since
2005?

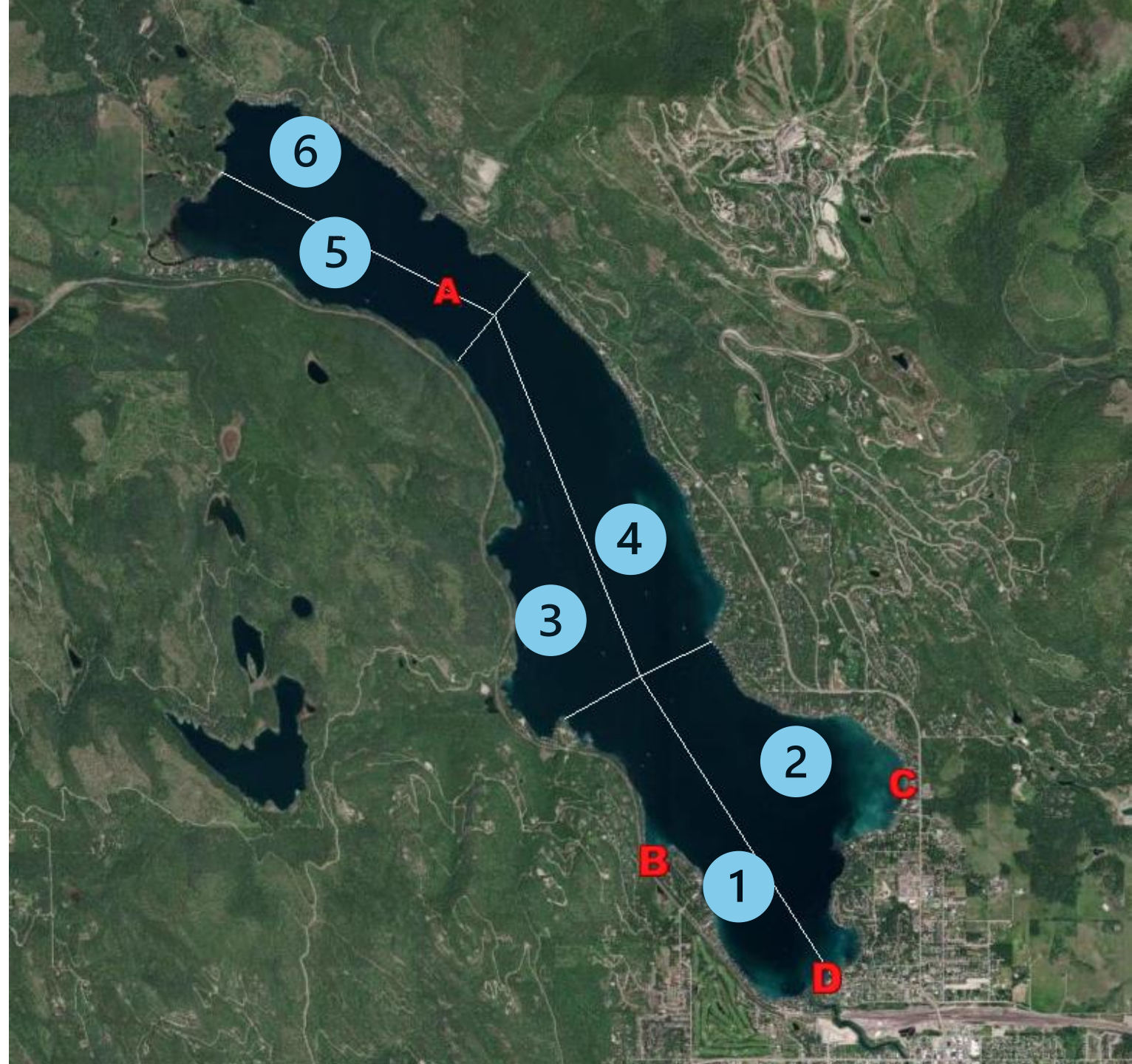
Dock Survey Methods

- Using satellite imagery to count boats slips and docks around the shore of the lake
- Images were taken in August of 2005 and 2023

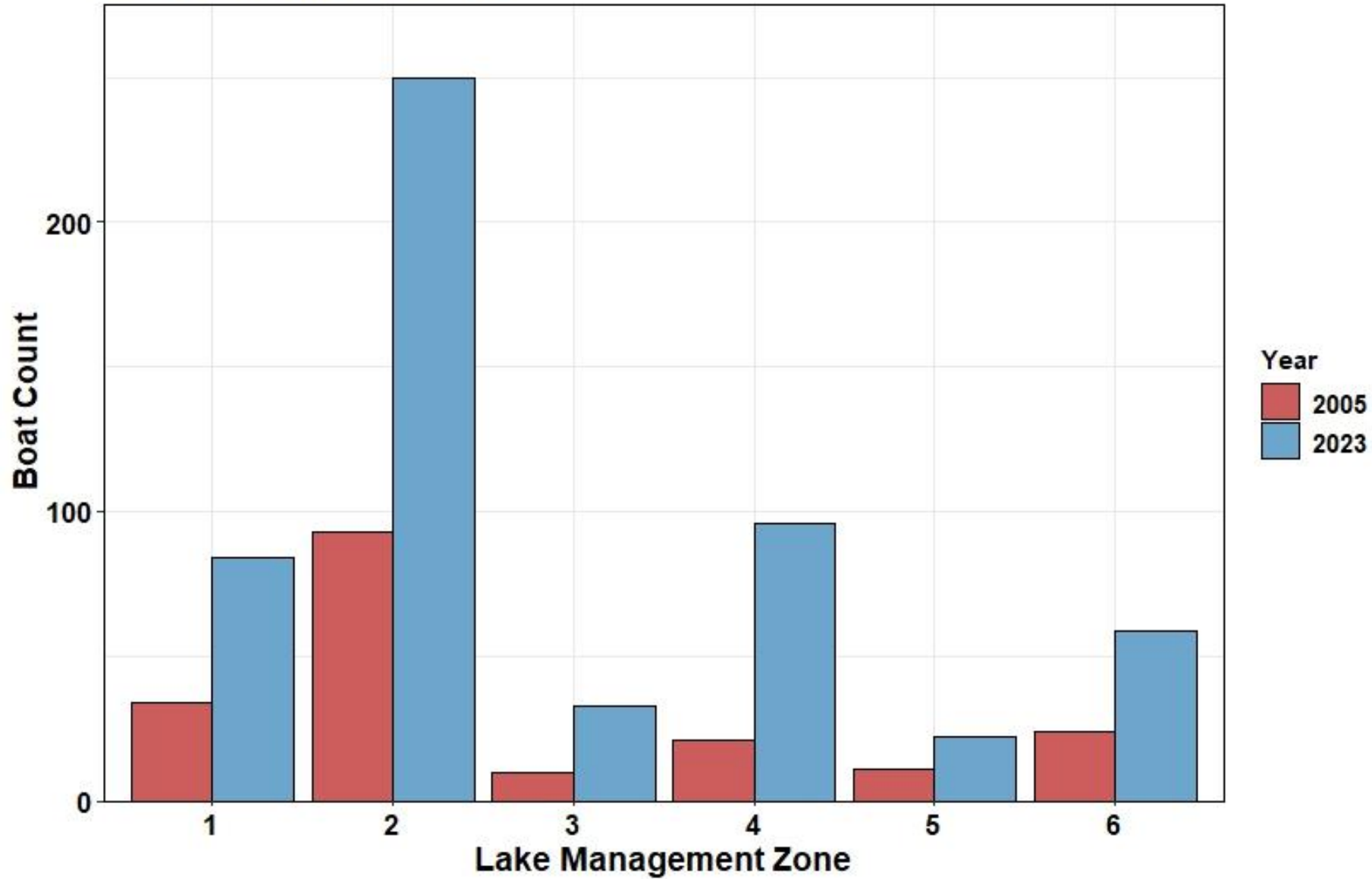


Whitefish Lake Management Zones

1. Southern zone highly developed includes City Beach
2. Southern zone highly developed includes The Lodge at Whitefish lake
3. Low development zone
4. Moderate development some homeowner associations
5. Northern part of the lake less developed
6. Northern part of the lake less developed



Boat Count 2005 vs. 2023



In every
management
zone boat
numbers
have
increased
since 2005

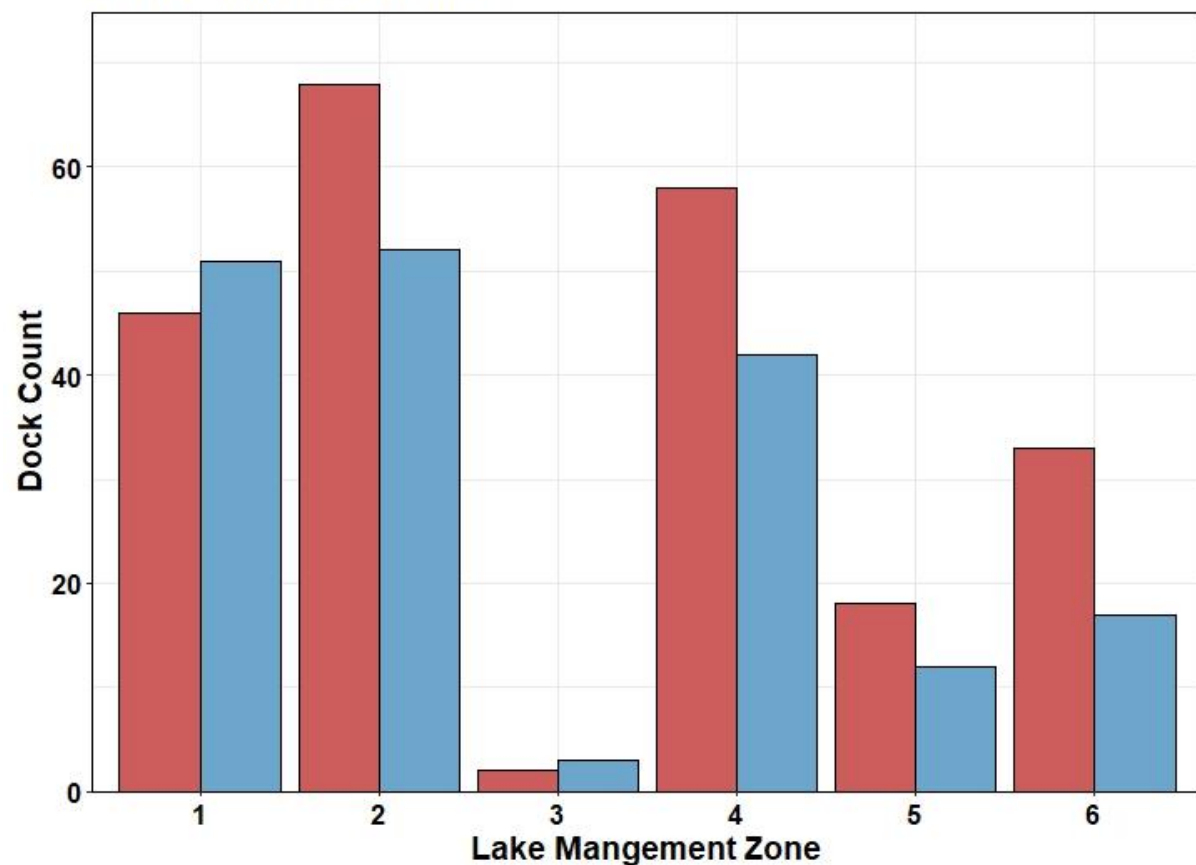
In every zone slip count increased, while in zones 2, 4, 5, 6 dock count decreased

Year

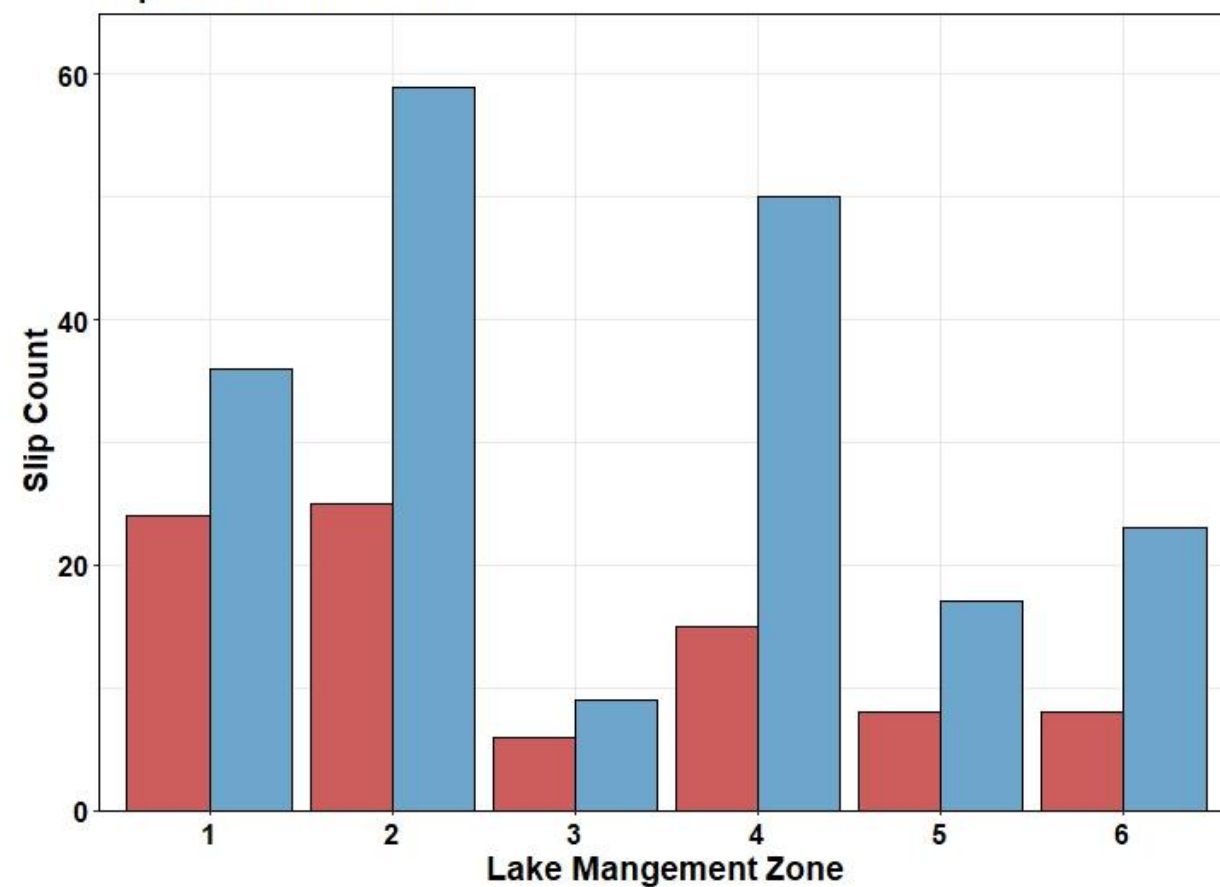
2005

2023

Dock Count 2005 vs. 2023



Slip Count 2005 vs. 2023

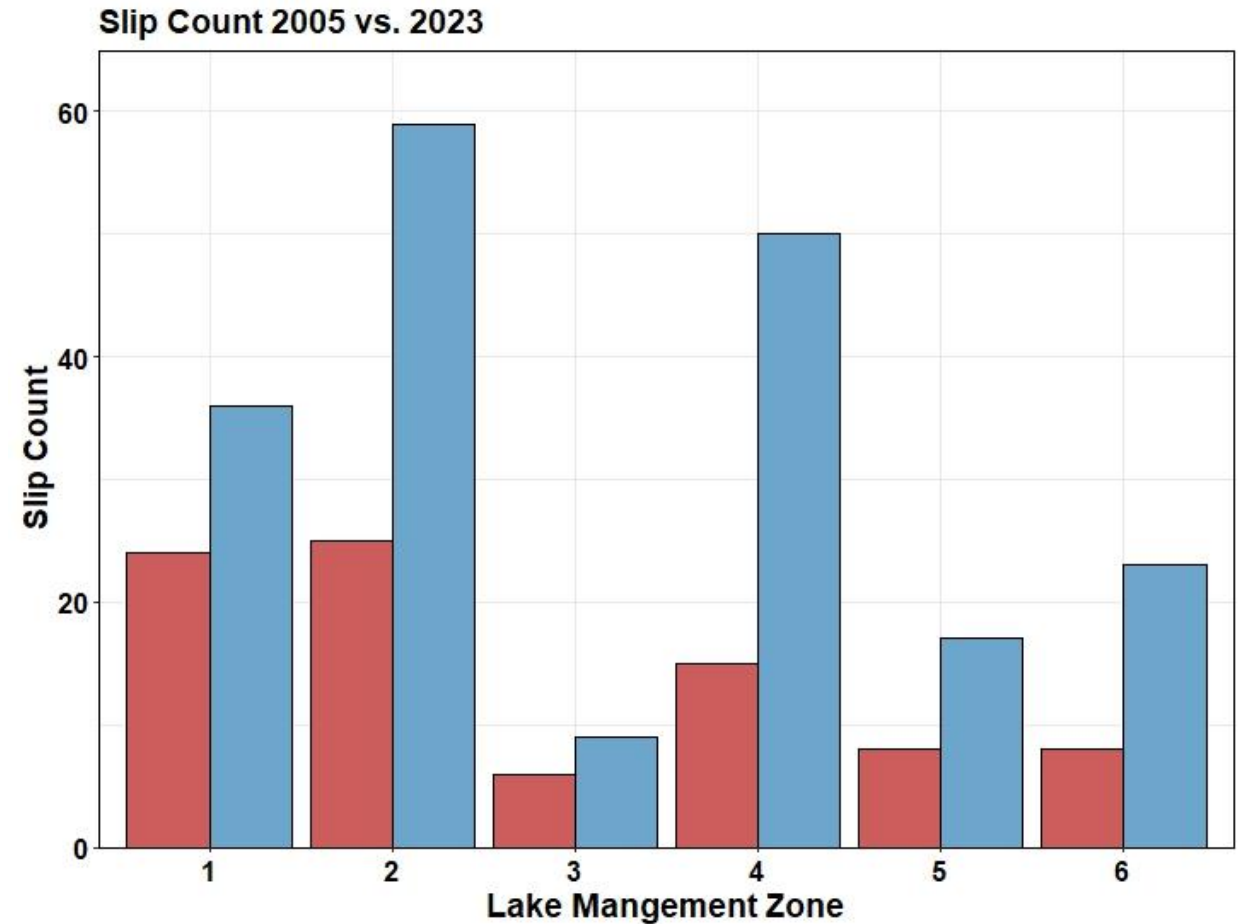
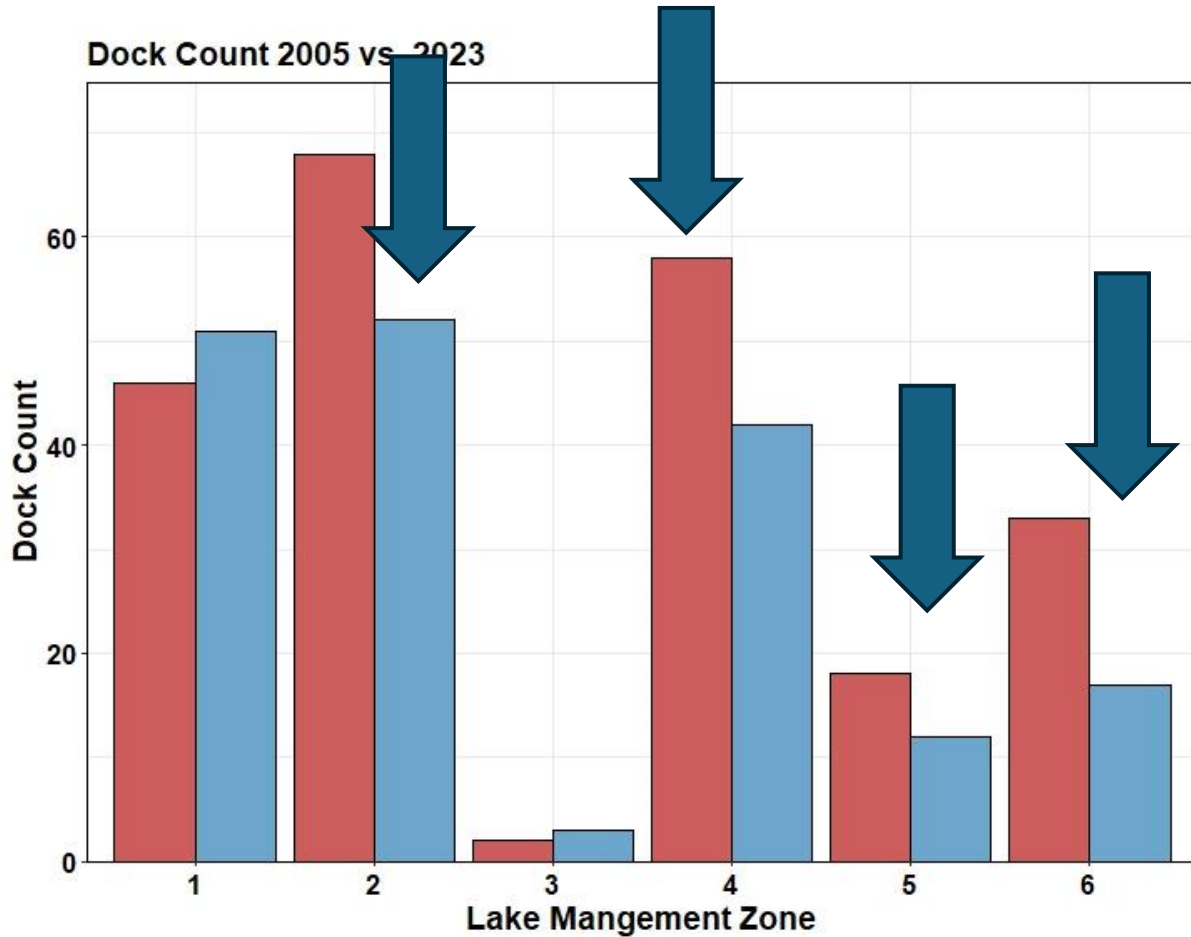


In every zone slip count increased, while in zones 2, 4, 5, 6 dock count decreased

Year

2005

2023



Main Takeaways

- Population increases have caused an increase in boats around the lake
- In many zones slips have increased while docks have not
 - Increase in HOA's or group owned docks
 - Increase in median home price means people can afford to have more than one boat



Questions?



Whitefish Lake
INSTITUTE

