

**Lake Erie Ecosystem
Service Assessment:
Benefits of Phosphorus
Reductions**

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University of Toledo Lake Erie Center
**KEY-LOG
ECONOMICS**

*webinar audio will be recorded

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What's at Stake



Harmful Algal Bloom (HAB) in 2019



Fishing for yellow perch on the dock near Marblehead Lighthouse

Scenic views at Put-In-Bay



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The Analysis: An Ecosystem Service Assessment

What is it?

Understand how benefits (or avoided costs) would accrue through connecting potential land and resource management actions with the maintenance and improvement of key ecosystem service values.

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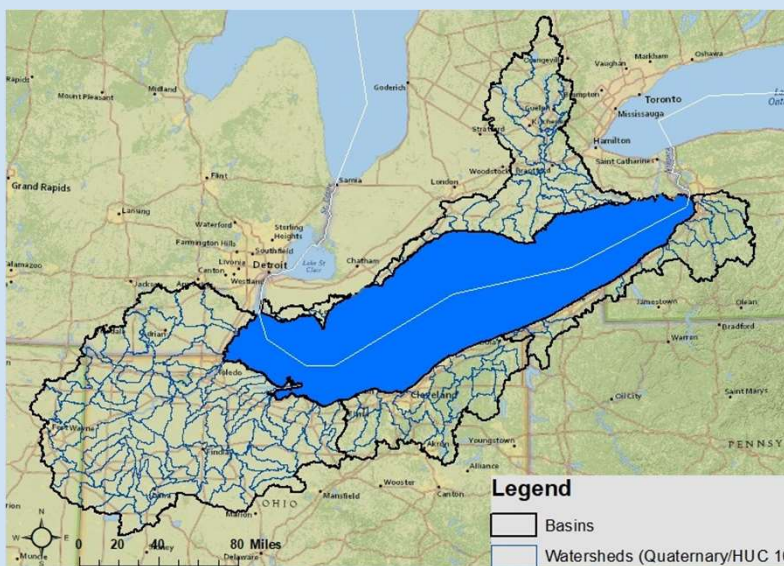
The Analysis: An Ecosystem Service Assessment

How do we implement the framework?

- Conduct participatory research.
- Analyze and estimate impacts of stressors in Lake Erie.
- Shed light on the economic and environmental impacts from water degradation.

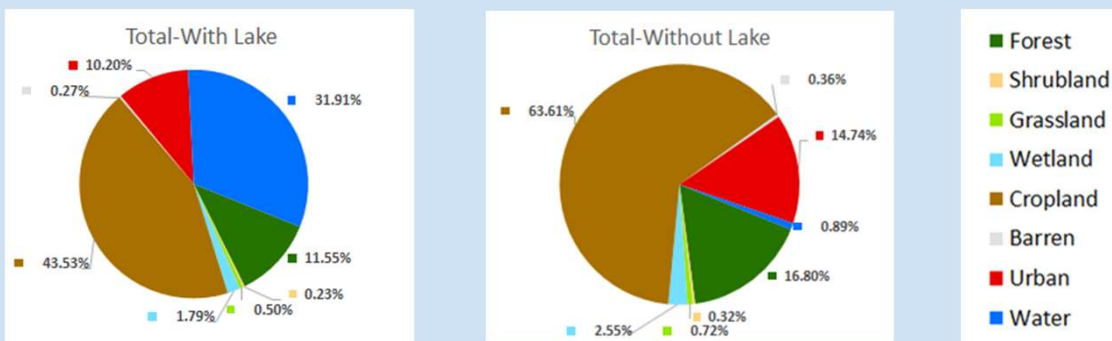
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Study Region: Lake Erie Subregion



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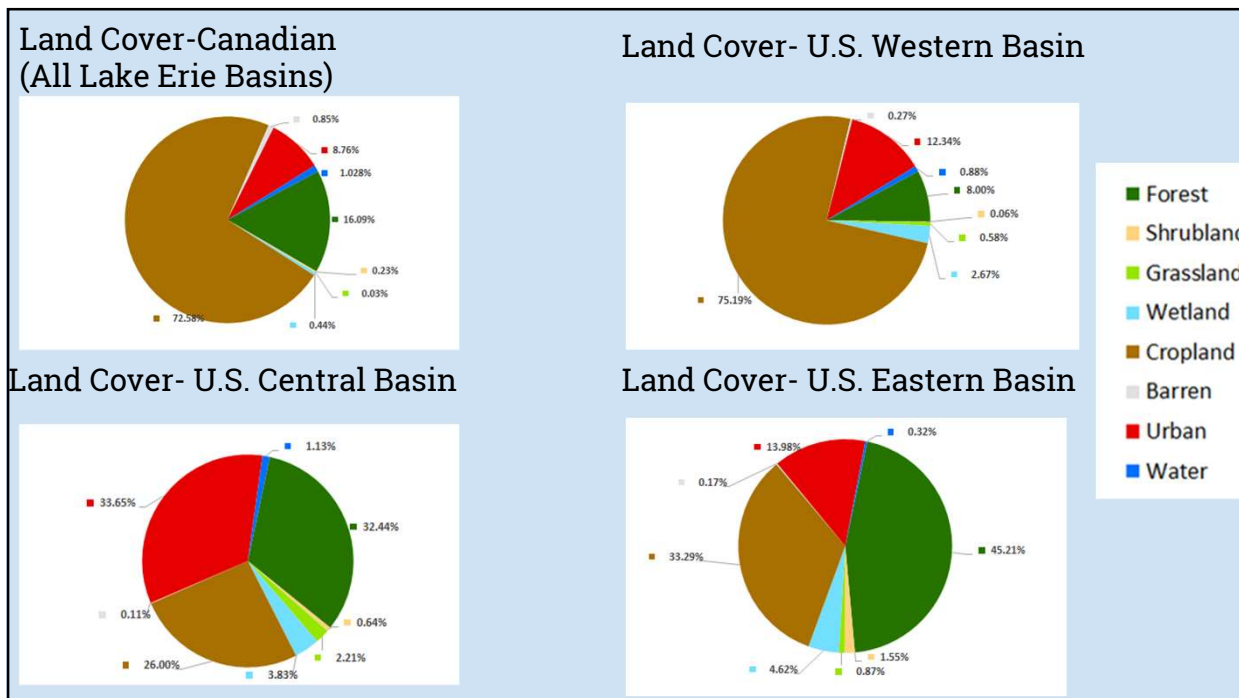
Land Cover In the Study Region



The study region provides ecosystem services worth \$443 billion

- \$326.9 billion to water related natural assets
- \$101.5 billion to cropland related natural assets
- \$14.6 billion other related natural assets

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Who Benefits from Phosphorus Reductions (\$\$\$)

This study estimates:

Benefits of achieving the GLWQA 40% phosphorus reduction target goal for

- Recreational anglers and beach-goers

Achieving other levels of phosphorus reduction

- Benefits for beach-goers
- Benefits for recreational anglers
- Avoiding potential property value losses
- Avoiding increased operating and treatment costs for water treatment plants

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Benefits for Beach-Related Recreation

- 20% reduction in the number of water quality advisories and beach closure days: **\$25 to \$28 million**
- 30% reduction in the number of water quality advisories and beach closure days: **\$38 to \$43 million**



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Benefits to Recreational Anglers

- Achieving the 40% GLWQA phosphorus reduction target goal: **\$117 to \$437 million**
- Achieving a 20% reduction in phosphorus loads: **\$44 to \$155 million**



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Potential Property Value Declines

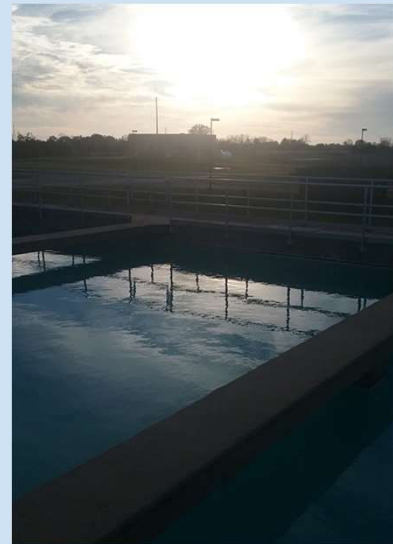
- Households within 20 meters of Lake Erie could experience property value declines of **\$686 million.**
- Households within 20 meters to 250 meters of Lake Erie could experience property value declines of **\$1 billion.**



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Costs to Water Treatment Plants

- In total, water treatment plants incur **\$3 million** in annual costs
 - U.S. plants incur **\$2 million** in annual costs
 - Canadian plants incur **\$889,778** in annual costs (2018\$ USD).
- Capital expenditures for algae-related projects total over **\$85 million** to date.



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Economic Impacts That Would Add to Algae Reduction Benefits



- Birding
- Boating/ Charter Boats
- Medical Costs
- Impacts to Downstream Communities



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SUMMARY

- **GLWQA 40% Target Phosphorus Reduction Benefits:**
 - Benefits of \$117 to \$437 million for recreational anglers
- **A 20% reduction in spring SRP loads from the Maumee River:**
 - Benefits of \$44 to \$155 million for recreational anglers.
- **20%/30% reduction in the number of water quality advisories and beach closure days:**
 - Benefits of \$25 to \$28 million - \$38 to \$43 million
- **Avoidance of Property Value Losses:**
 - \$686 million to \$1 billion
- **Potential Decreases in Algae Related Treatment and Monitoring for Water Treatment Plants:**
 - \$3 million

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Questions?

Find the report at:
keylogeconomics.com/lakeerievalue