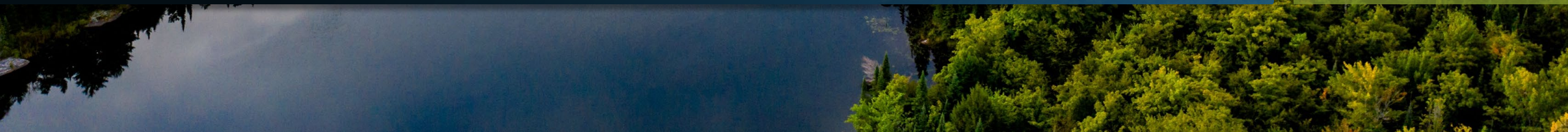
Mirror Lake Water Quality Study

Public Engagement Meeting

November 9, 2022



Our Team

Janna Kieffer, PE

District Engineer

Keith Pilgrim, PhD

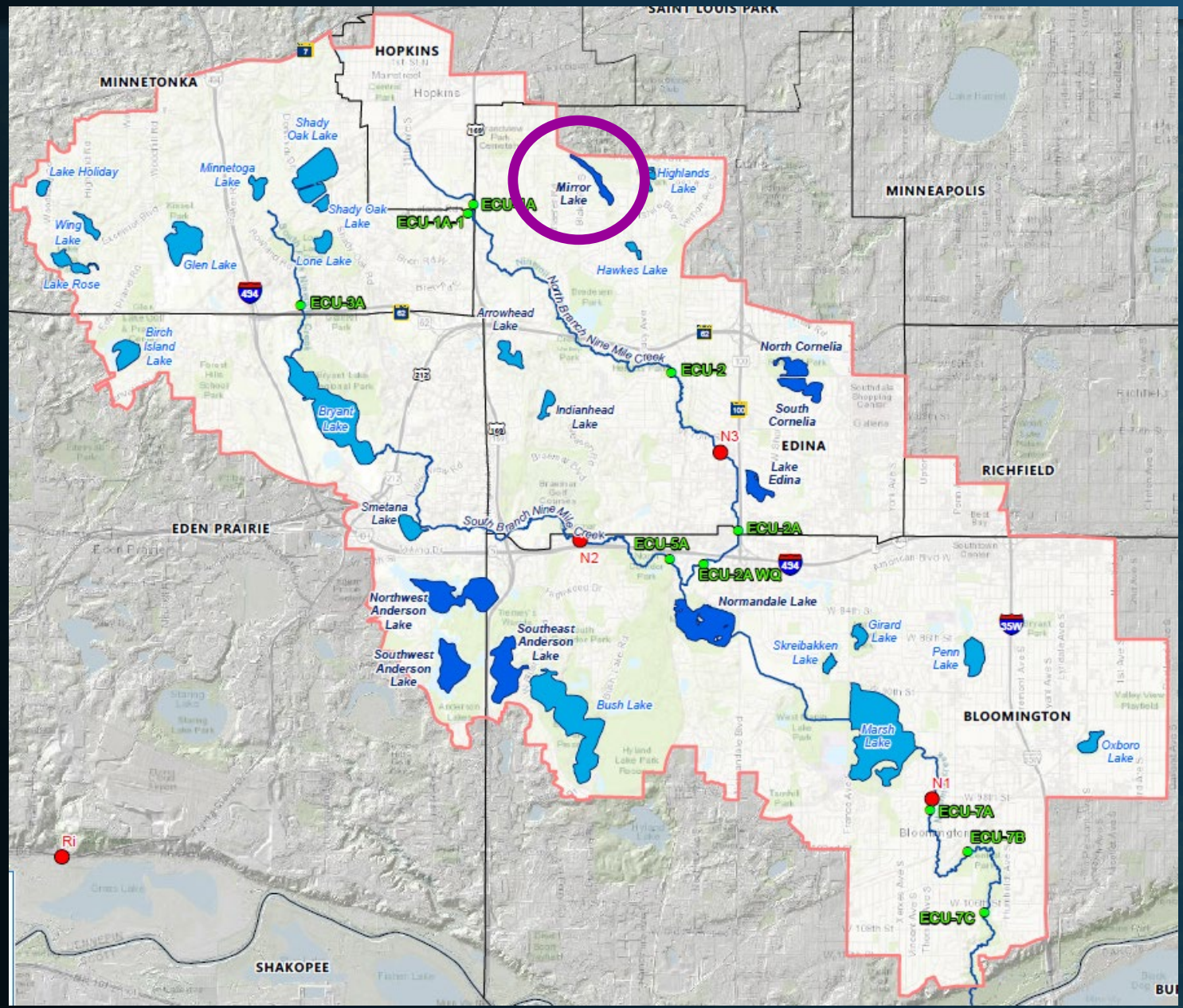
Limnologist & Senior Water Resources Scientist

Katie Turpin-Nagel, PE

Water Resources Engineer

Photo: Mirror Lake, August 2021

NMCWD – Mirror Lake Location

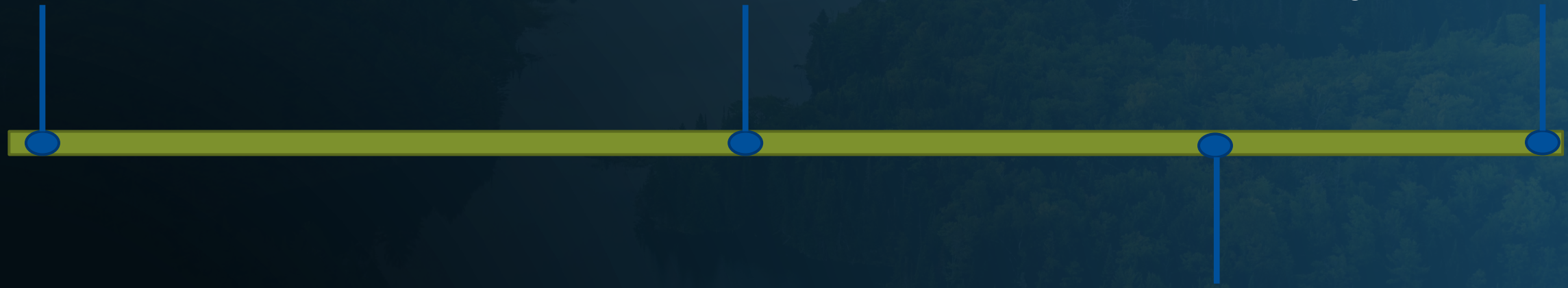


Mirror Lake- Timeline

1982 – Water Quality Study
- Residents concerned about aquatic plants and algae
- Aquatic plant and algal management begins

2004 – Water Quality Study
- Identified sources of excess phosphorus
- Recommended management activities

2022 – Water Quality Study
- Use historical and recent monitoring data to understand lake conditions
- Analyze and implement new management techniques



2015 – Edina Lakes & Ponds Policy Updates
- General aquatic plant management stops
- Promote native plant species

Agenda

1. Shallow Lake Management Objectives Background
   a) What causes stress in our lakes?
   b) Is Mirror Lake experiencing these stresses?
   c) How can we break the stressor cycle?

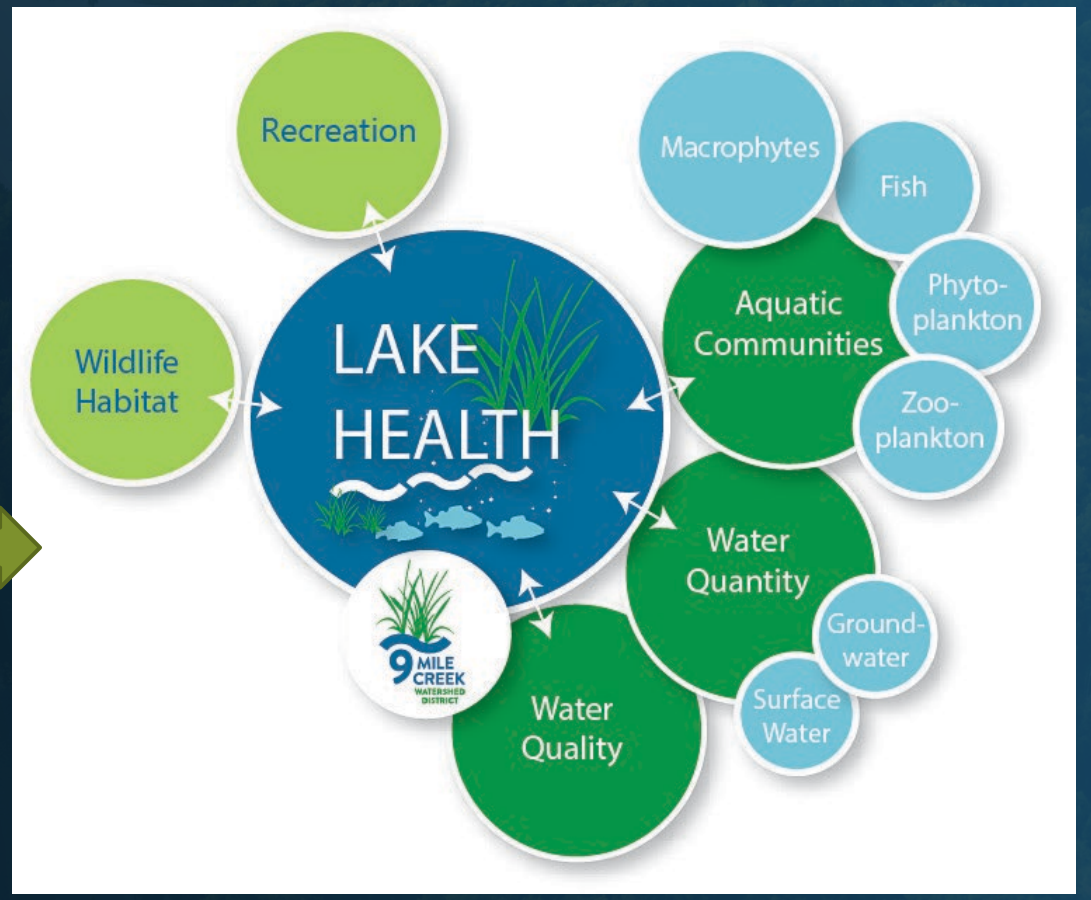
2. Water Quality Study Objectives

3. How can residents help our study?

Shallow Lake Management Objectives

- Holistic approach to lake management
- Manage to:
  - Meet water quality standards
  - Achieve a balanced ecosystem

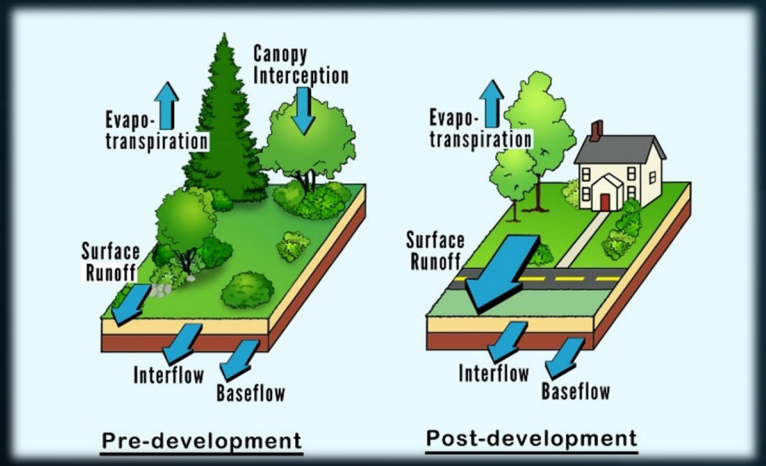
Balanced
Phosphorus
&
Nitrogen



Where do phosphorus/nitrogen come from?

External Source

Stormwater Runoff



Phosphorus
Nitrogen

Internal Sources

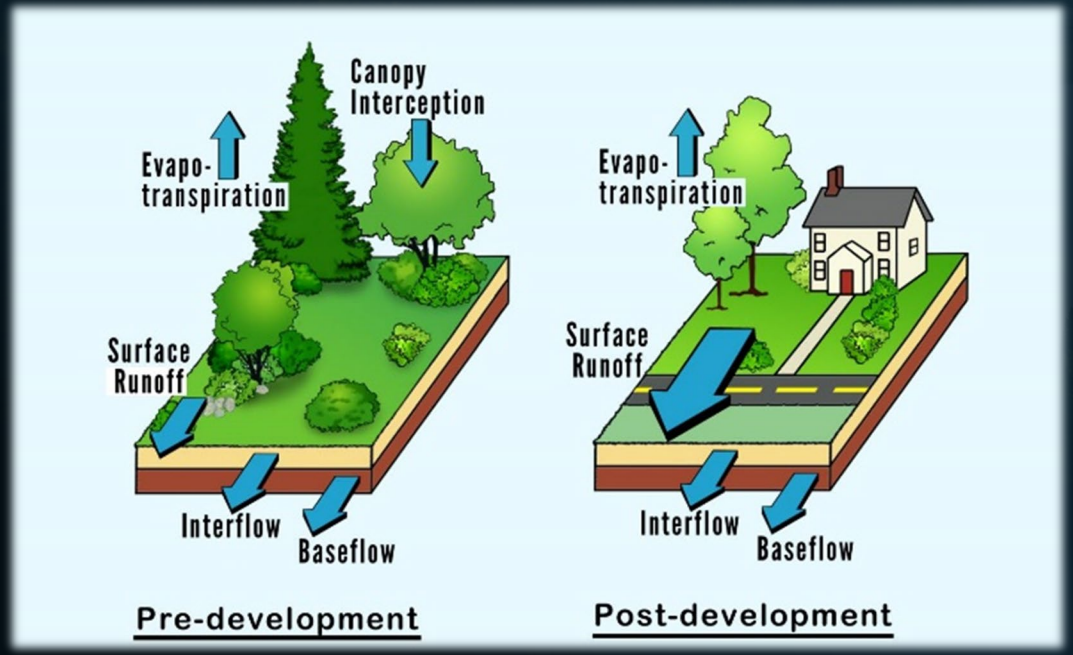
Curly-leaf Pondweed (Invasive)

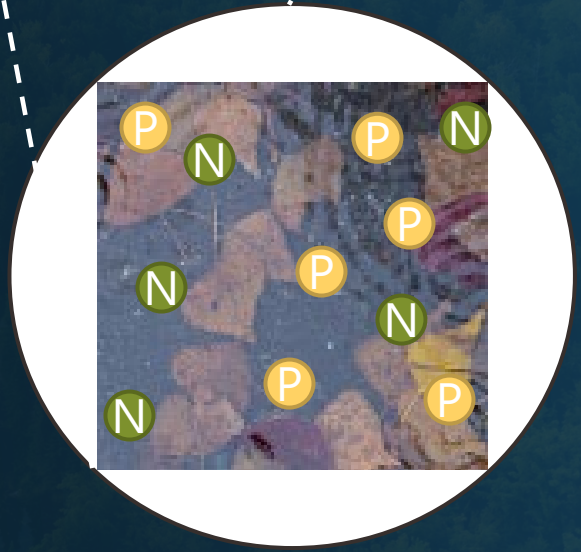
Nutrient Rich Sediments

Where do phosphorus/nitrogen come from?

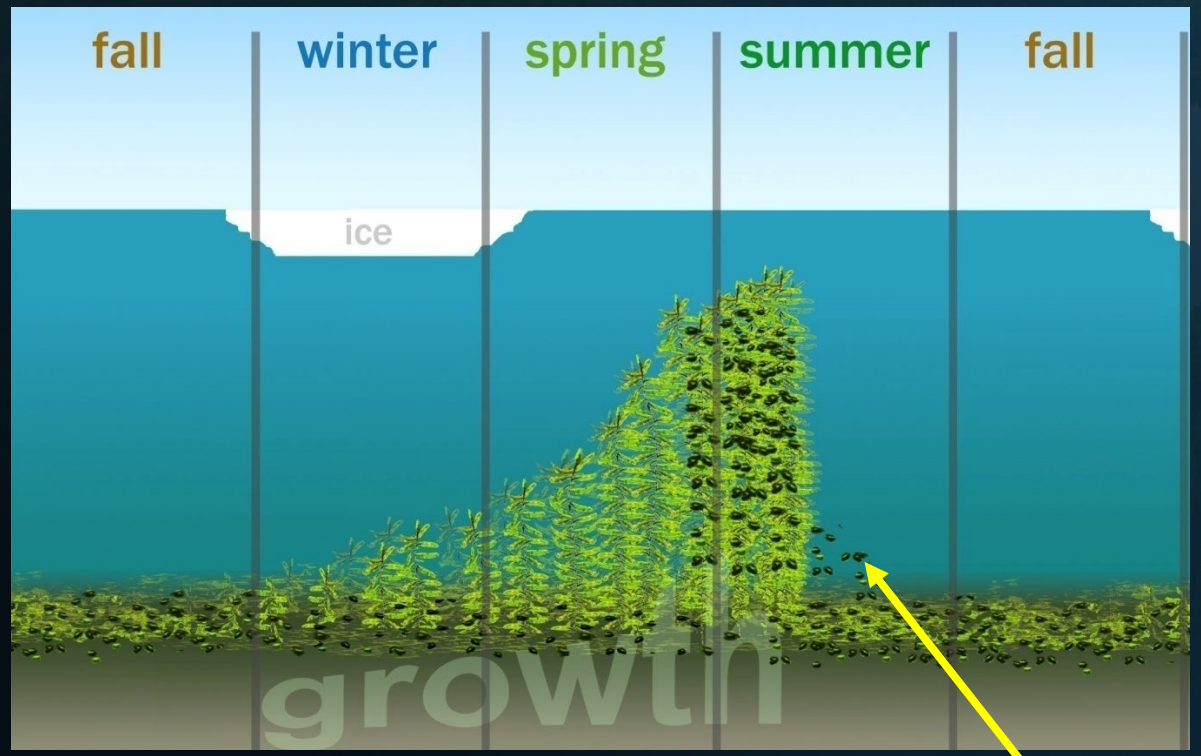
External Source

Stormwater Runoff





Where do phosphorus/nitrogen come from?

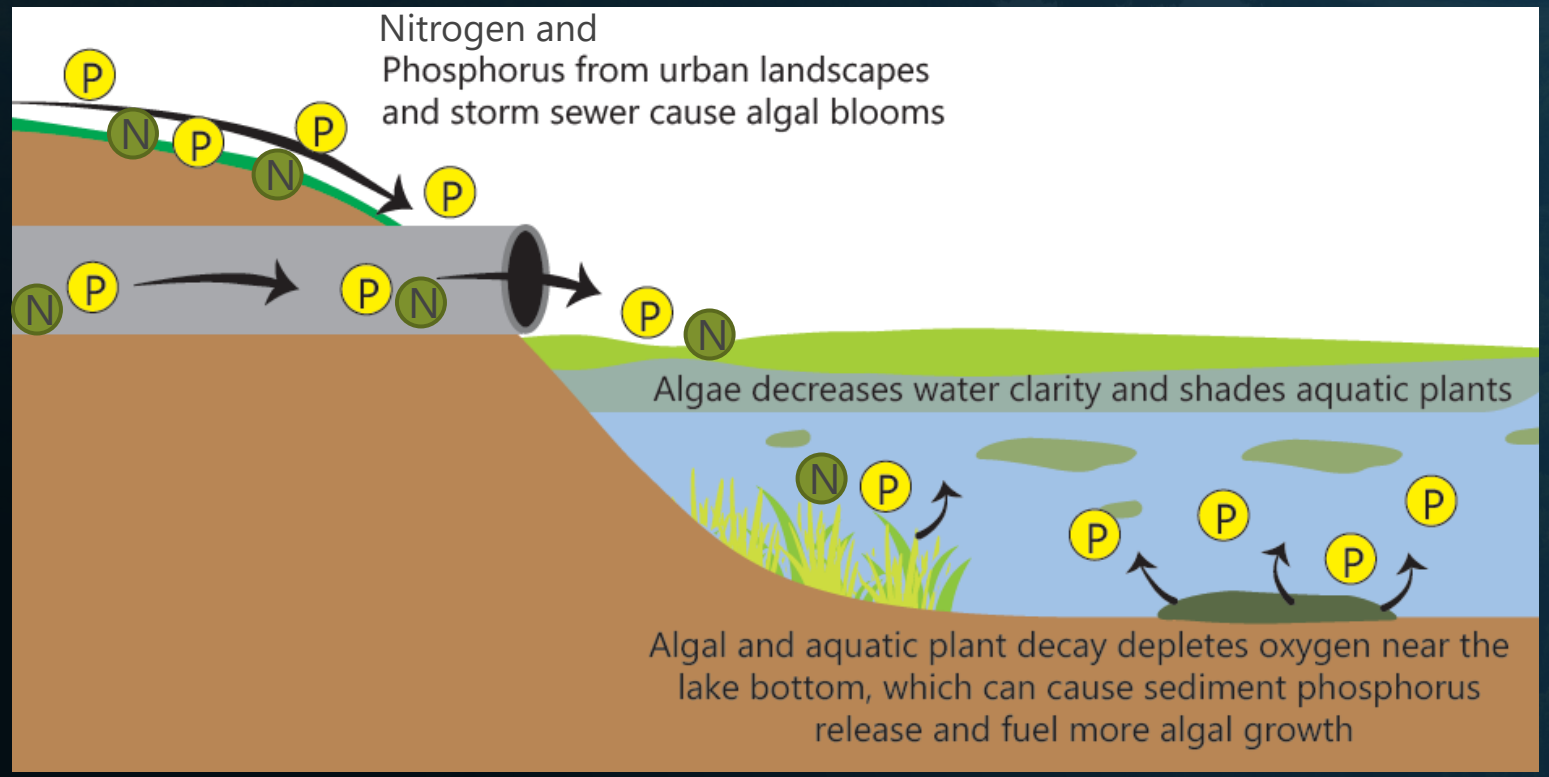


Curly-leaf turion

Internal Sources

Curly-leaf Pondweed (Invasive)

Where do phosphorus/nitrogen come from?



Internal Sources

Nutrient Rich Sediments

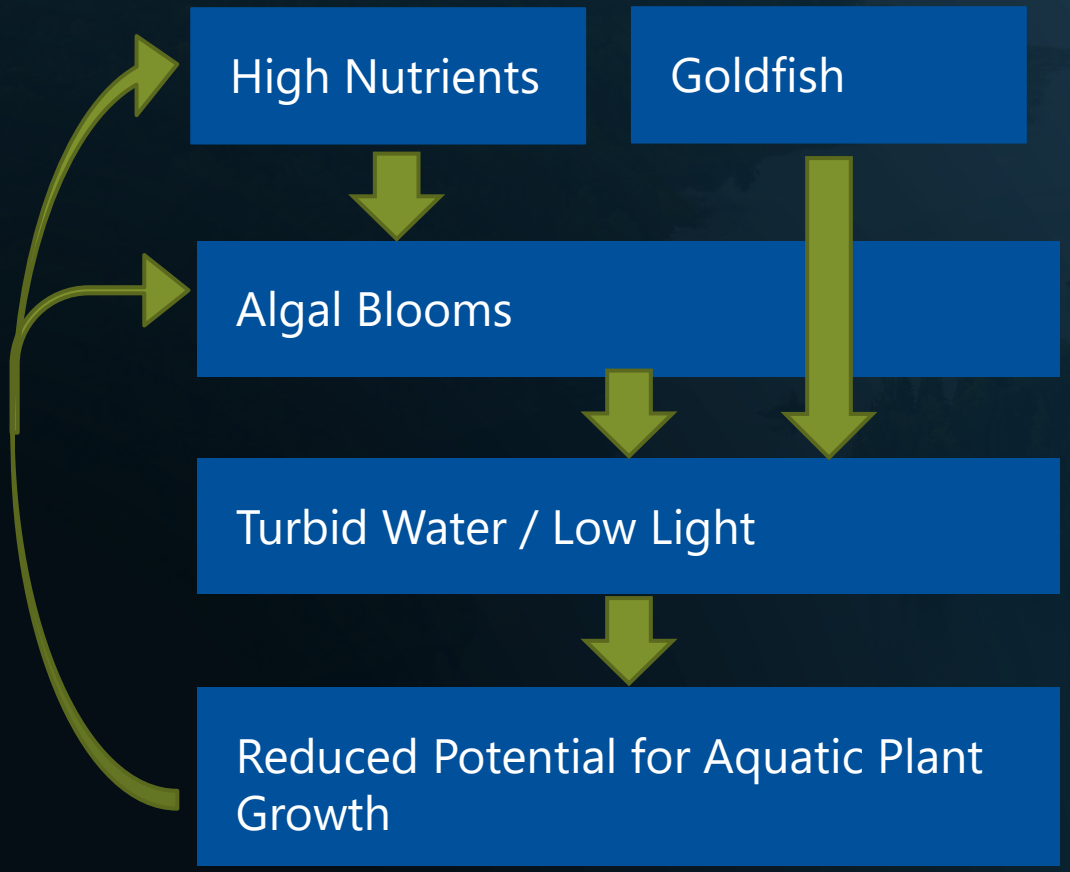
Other than nutrients, what else can impact water quality?

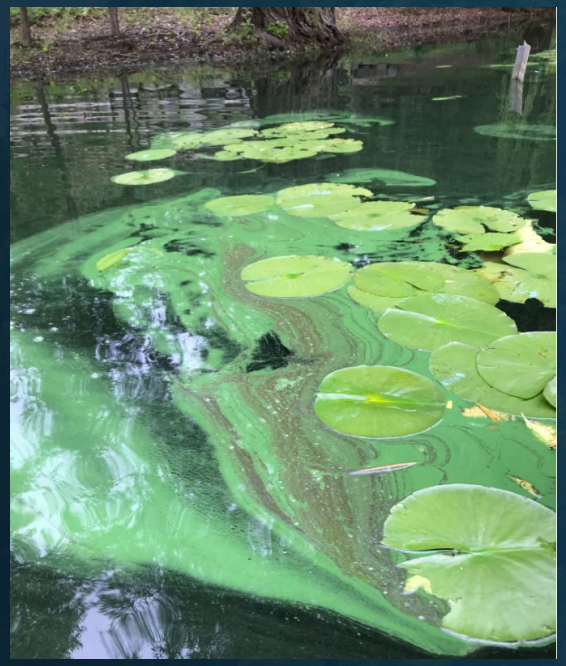
Goldfish/Carp – Bottom Feeding Fish

Photo: Mirror Lake, May 2019

Shallow Lake Stressors/Threats

Stressors/Threats to Healthy Lake Conditions





Example Algal Blooms

Water Quality Conditions – Mirror Lake

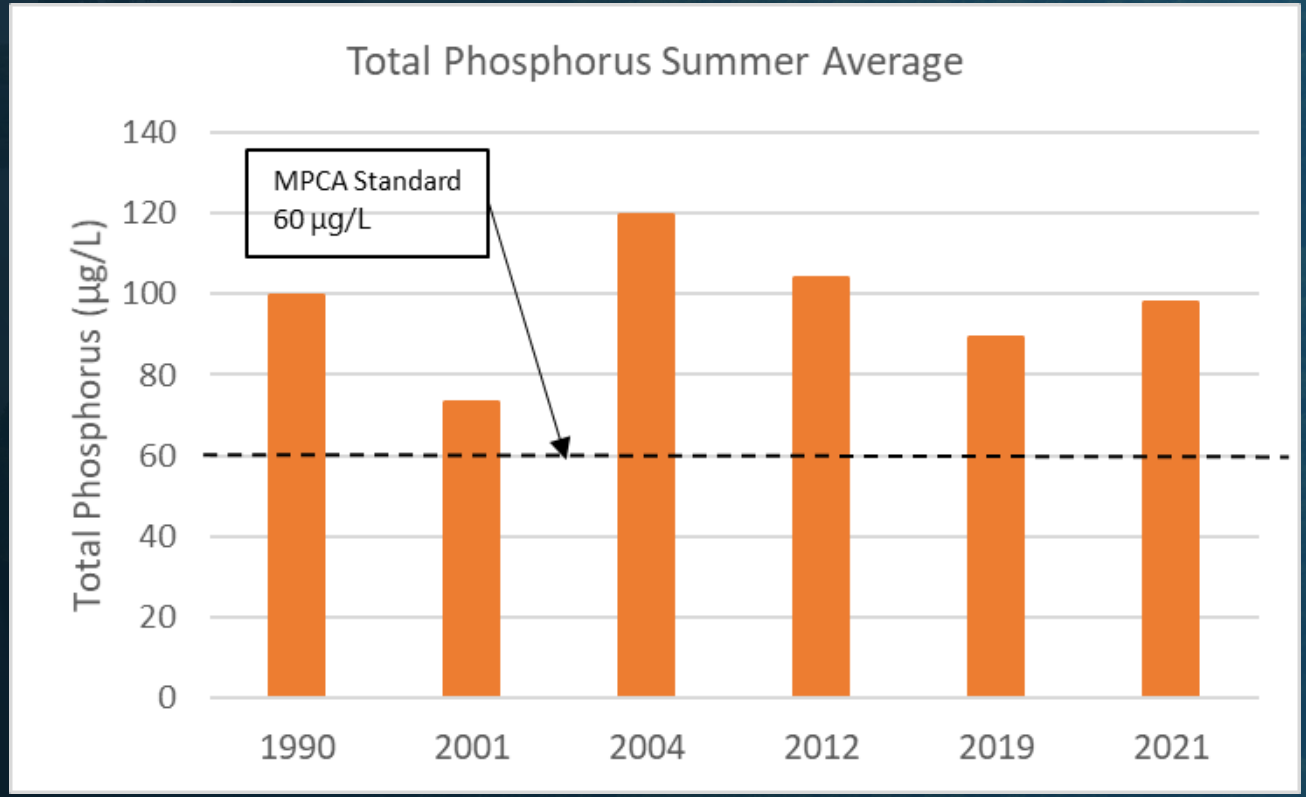
High Nutrients

↓

Algal Blooms

↓

Turbid Water / Low Light



Water Quality Conditions – Mirror Lake

High Nutrients

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Algal Blooms

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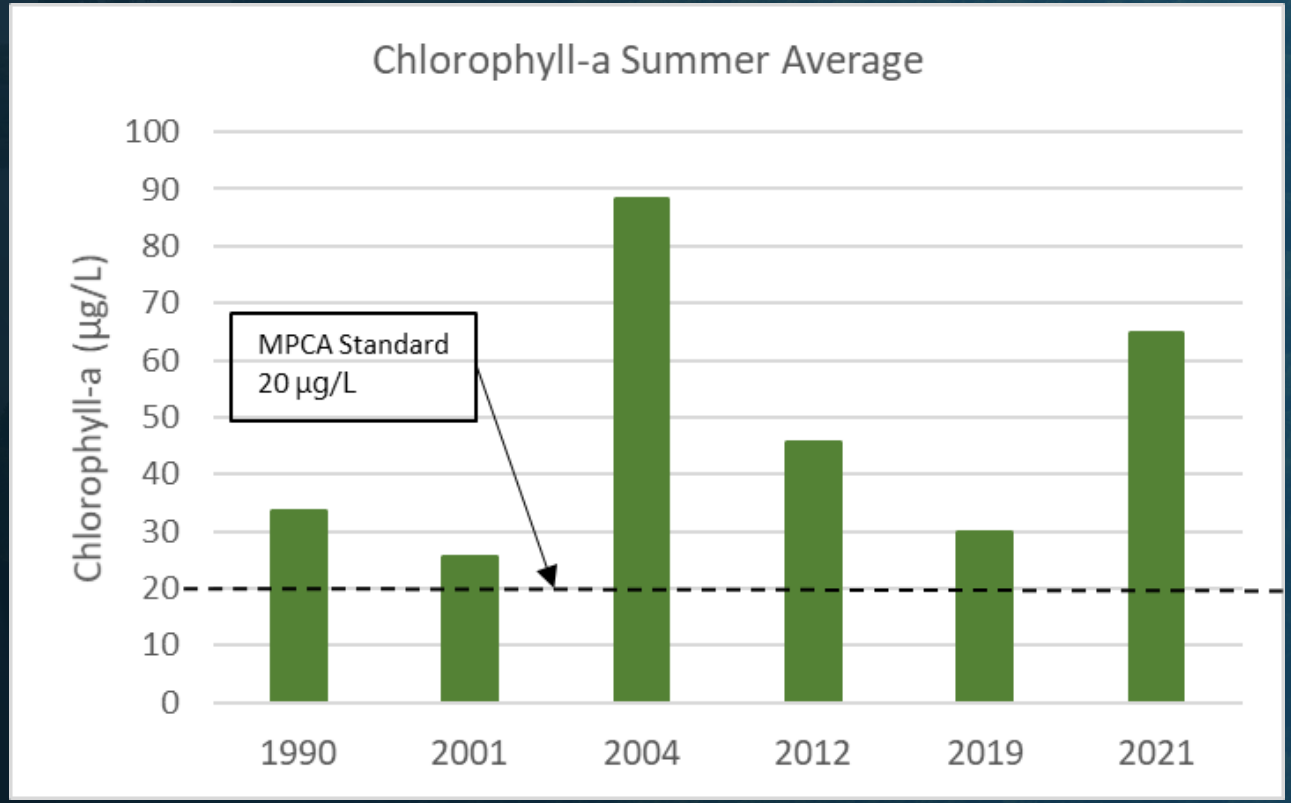
Turbid Water / Low Light



Water Quality Conditions – Mirror Lake

High Nutrients

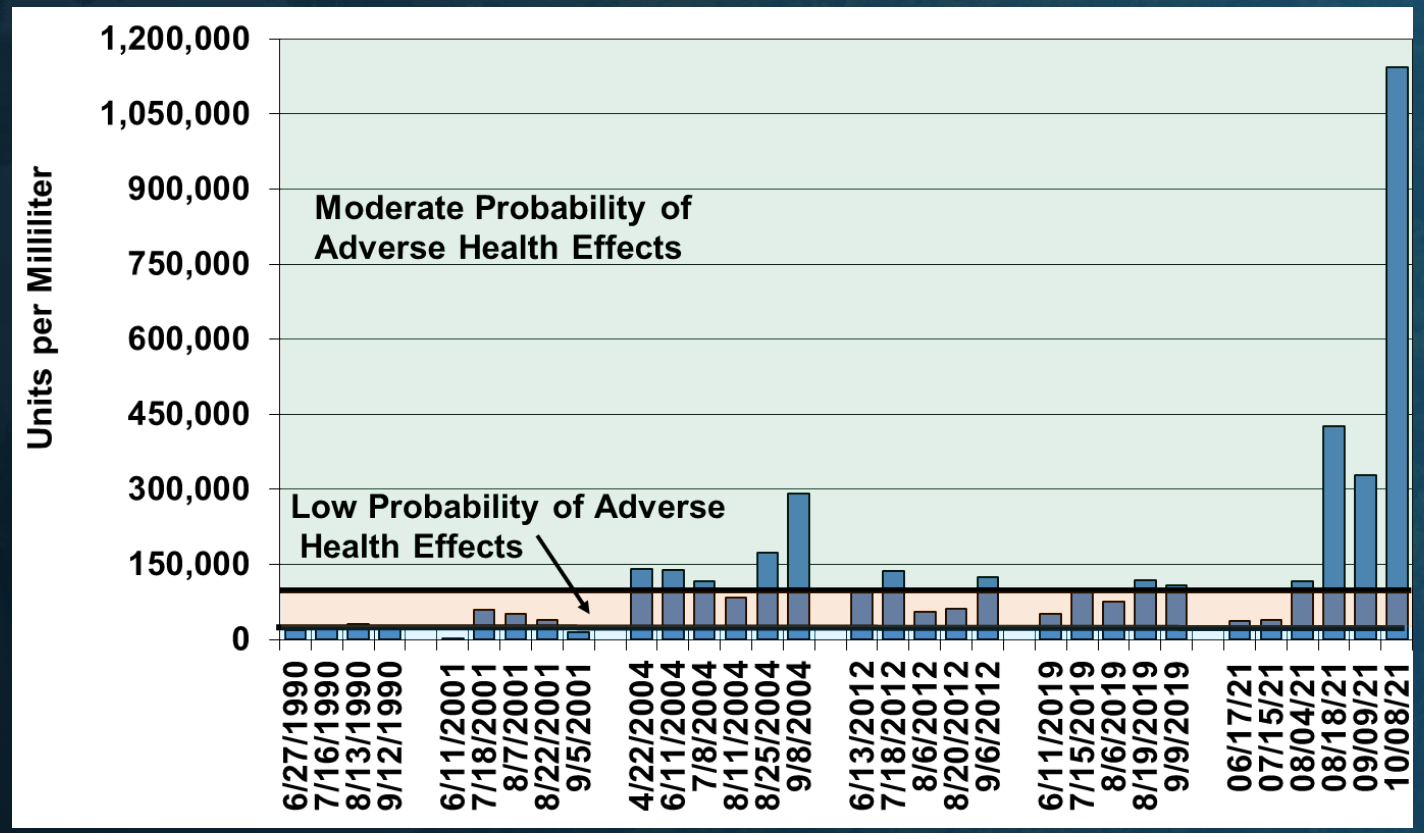
↓

Algal Blooms

↓

Turbid Water / Low Light

Blue-Green Algae Counts



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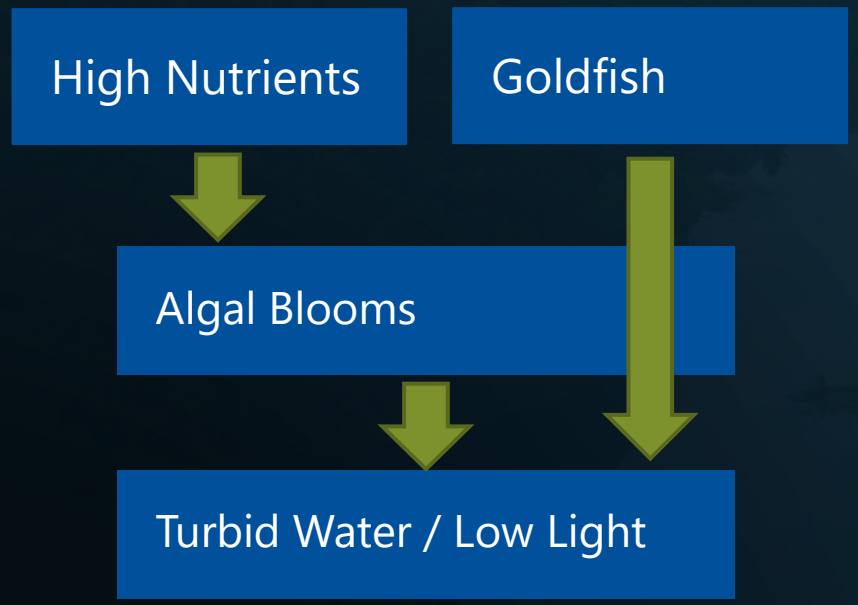
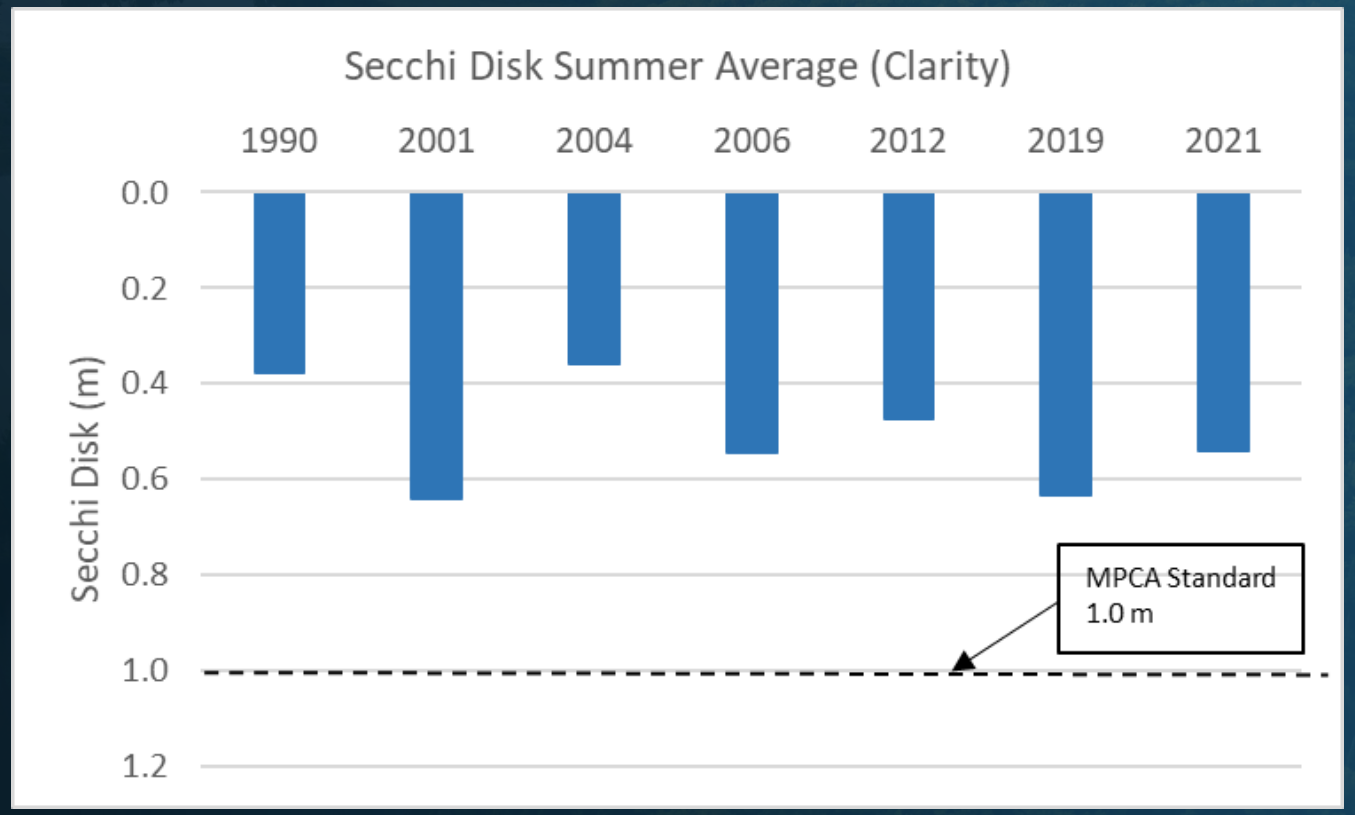
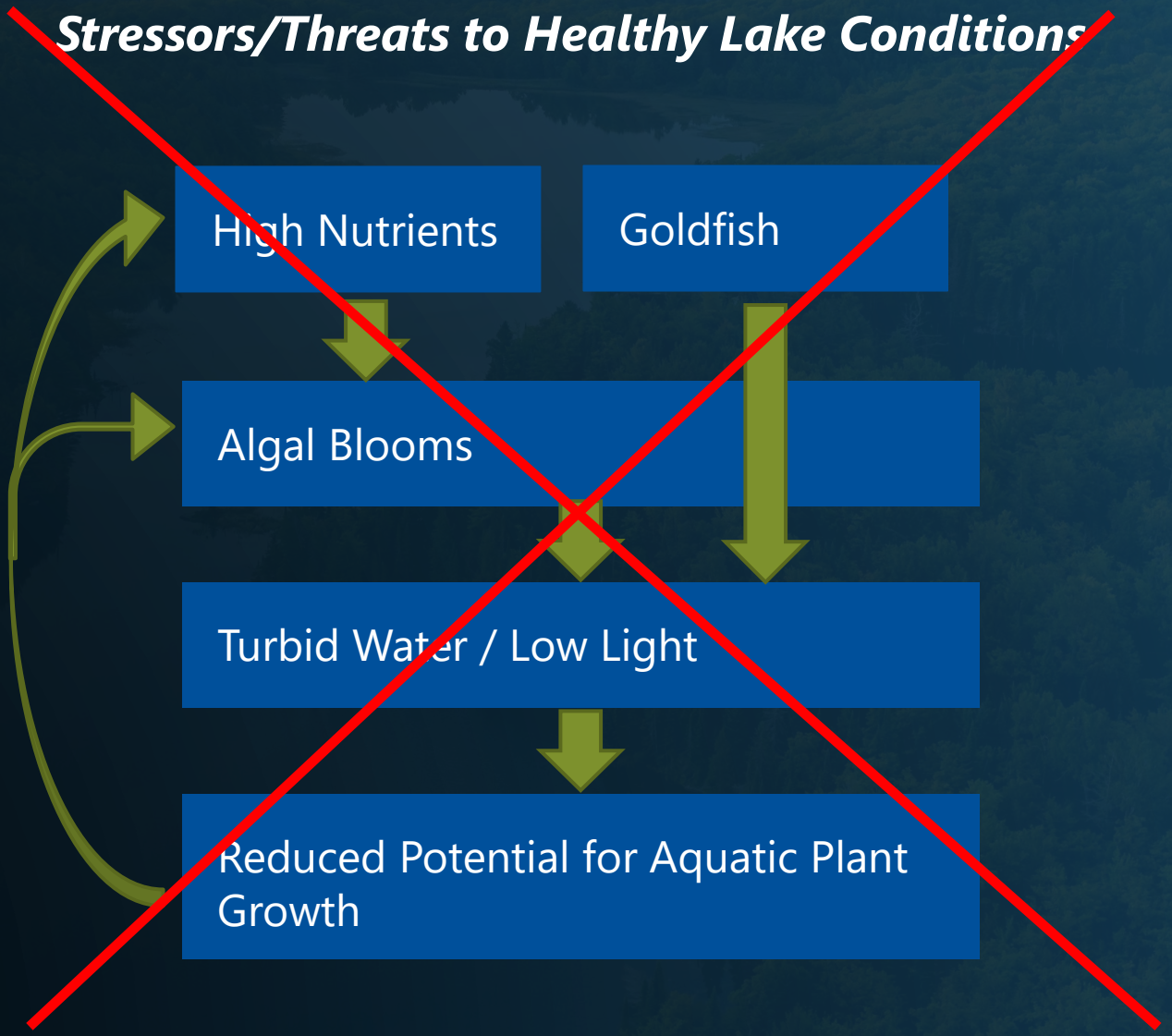
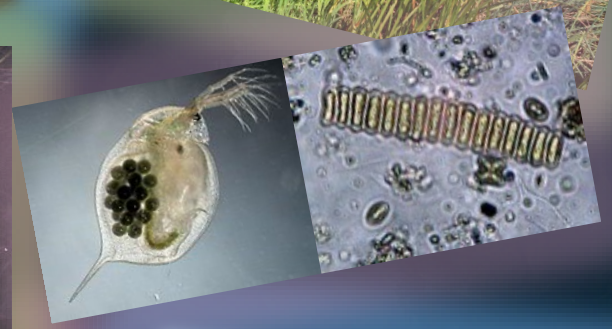




Breaking the Stressor Cycle to Promote a Healthier Lake



Breaking the Stressor Cycle to Promote a Healthier Lake



1. Reduce nutrients entering the lake
    a) External Sources
    b) Internal Sources
2. Promote Diverse, Native Plants
    a) Within the Lake
    b) Shoreline Buffer Zones
3. Balanced Aquatic Community
    a) Algae
    b) Zooplankton/Aquatic Insects
    c) Fishery

Water Quality Study Objectives

Monitoring Data
(Water Quality, Ecological)

Public Input/
Observations

Quantify by Modeling
Nutrient Sources/Sinks

test

test

In-Lake
Management
Alternatives

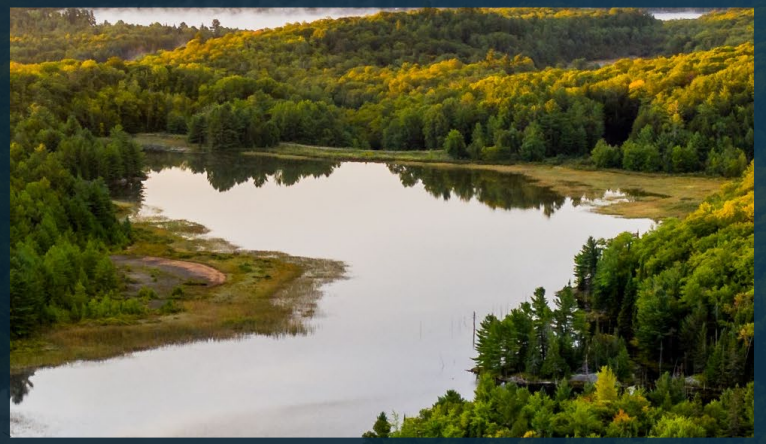
Watershed
Management
Alternatives

Progress towards
Water Quality and
Ecological Goals

We need your help as we start!

1. Thank you for attending the meeting today and participating in discussion!
2. Survey – Available through November 16
    1. Tell us how you use/enjoy the lake
    2. Describe current concerns regarding lake health
    3. Express interest in helping to improve water quality
    4. Ask questions
    5. And more!

https://ninemilecreek.typeform.com/MirrorLake



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Questions?