Loch Lomond Lake Monitoring 2026





Monitoring Sites:

1. South Bay
   Primary LCHD
2. Dam
3. North Bay



Loch Lomond Bathymetric Map June, 2021

Morphometric Data
Surface Area: 75.57 Acres
Maximum Depth: 8.37 Feet
Average Depth: 5.16 Feet
Volume of Lake: 369.22 Acre-Feet
Shoreline Length: 2.28 Miles
Lake Elevation: 738.84 Feet above MSL1

Survey Data Collected June 29, 2021
This map is intended for water quality reference only, not intended for navigational, swimming or diving purposes

LakeCounty
Health Department and
Community Health Center

0 200 400 600 800 1,000 Feet

Ecological Services
Product Number LL2021
Revised 08/2021

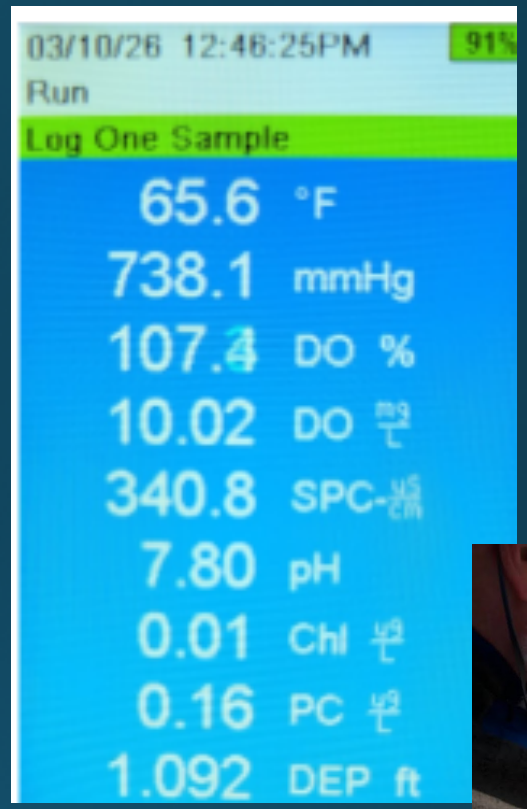
Summary Info



- Surface Area: 74.85 acres
- Volume: 376.08 acre-feet
- Depth: Shallow - Deepest 8', Average depth 5'
- Shoreline: 2.18 miles; 100% Developed 100+ homes on shoreline
- Watershed Area: 1439 acres
- Lake Type: Impoundment, Man-made
- Watersheds: Des Plaines River Watershed & Bull Creek South Sub-watershed
- Uses: Fishing, low-motorized boating, swimming, aesthetics
- Interesting Fact: 1" of Rain on 75 acres = 2+ million gallons of water + Runoff from land + Upstream inputs

Water Monitoring Program

- Measurements every 2 weeks April -October
  - Lake Depth & Secchi Depth - Clarity
  - Temperature
  - Dissolved Oxygen
  - Oxidation Reduction Potential
  - pH
  - Total Dissolved Solids
  - Chlorophyll-a
  - Phycocyanin
  - Conductivity & Salinity
  - Soluble Reactive Phosphate @ 3' depth
  - Weather data: Rainfall & Air Temperature
- Develop usable Charts & Graphs



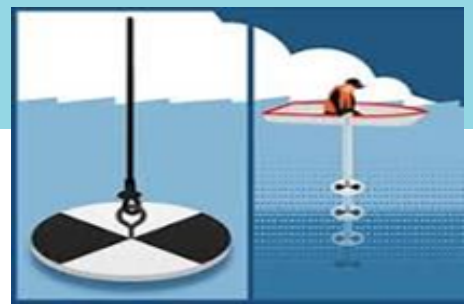








Secchi Depths - Clarity

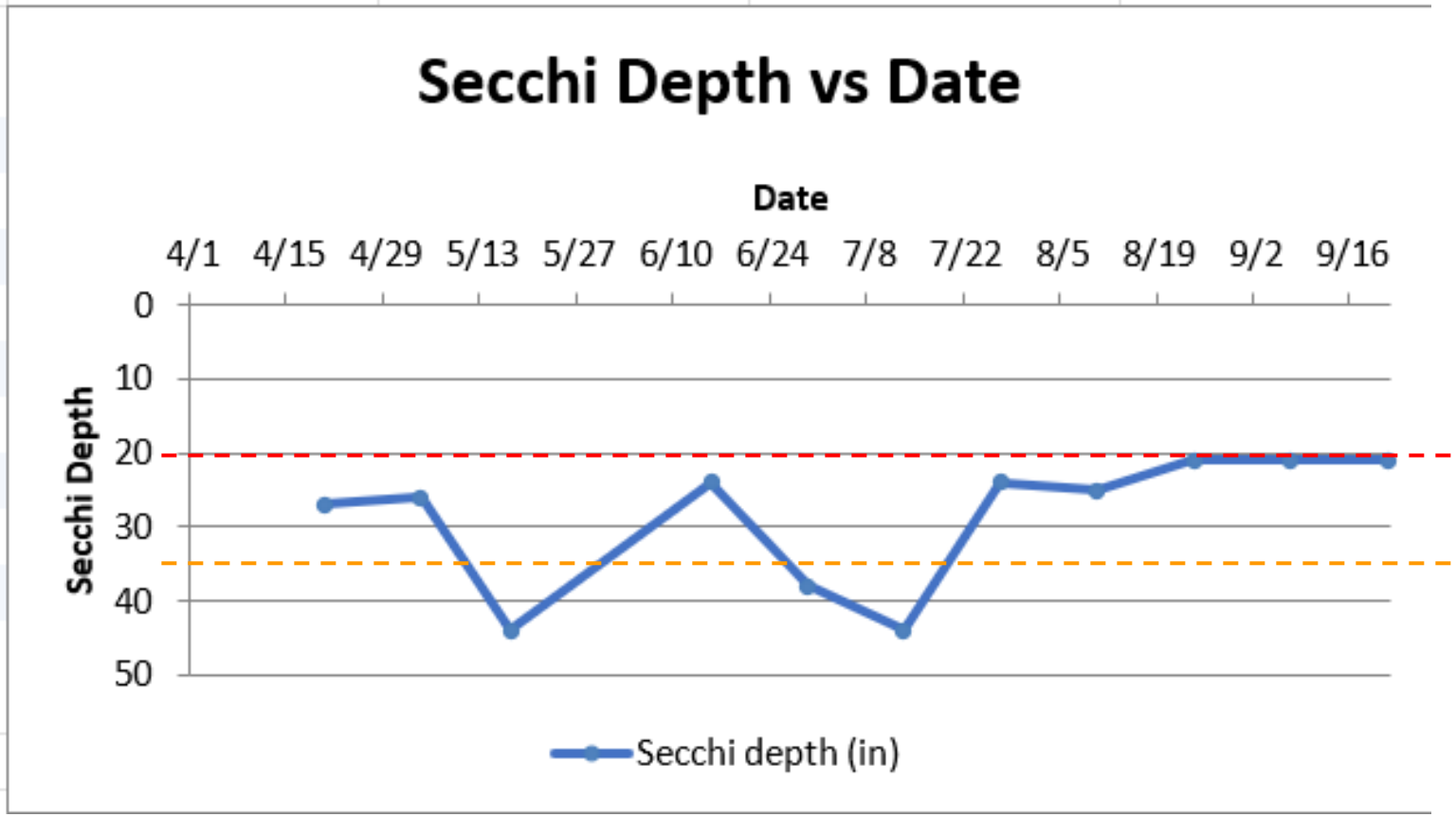




- **Secchi Depths** –water clarity affected by suspended & dissolved substances e.g., algae, sediments, organic matter, etc. Greater depths means photosynthesis reaches further down water column. Changes seasonally.

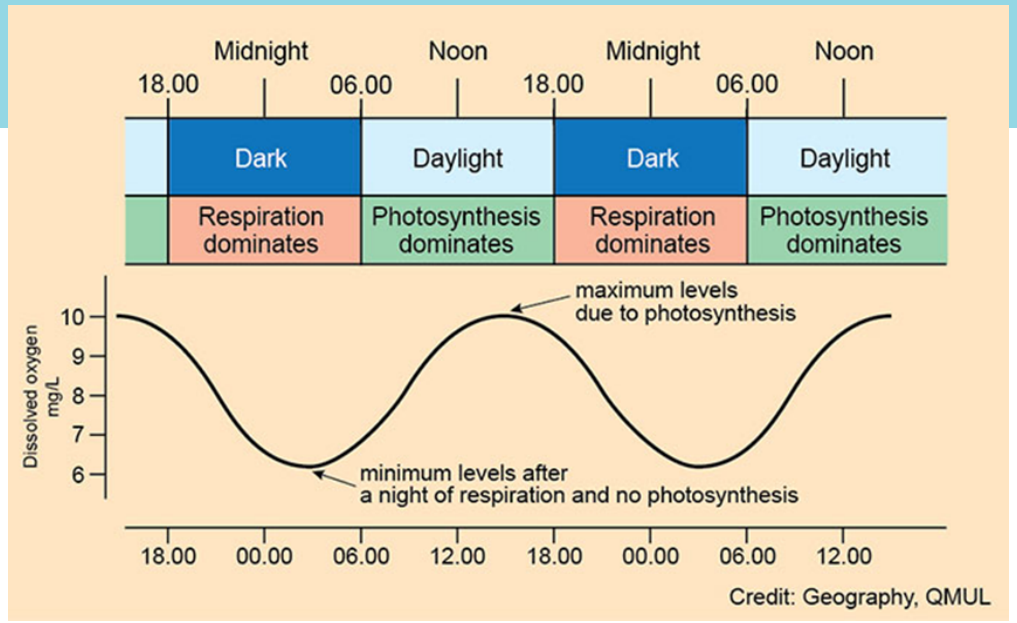
- ***Lake County Median = 3.1' or 37"***

- **Trophic State**
  - **<1'** May be lethally low DO
  - ***<20" Hypereutrophic/ Impaired***
  - ***20"- 80" Eutrophic/ Moderatly Impaired***
  - **<36" Suggests high P & N**
  - ***80"-150"*** *Mesotrophic/ Balanced*
  - ***>150"*** *Oligotrophic*



2026 – Mostly Eutrophic; Below average clarity; high winds, rainfalls, beaver dam break affected clarity

Dissolved Oxygen - Heat Map



- **Dissolved Oxygen, DO -** measures O_2 gas dissolved in water.
- DO changes seasonally & daily
- DO decrease with high temperatures
- DO increases midday

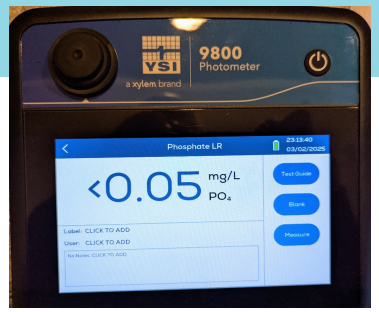
- ***Algae consumes O_2 night & day - Cellular Respiration***
- ***Algae produces O_2 during the day – Photosynthesis***

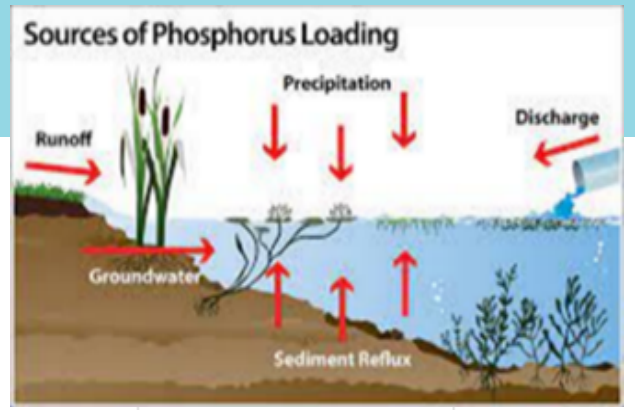
Depth (ft) \ Date	20-Apr	04-May	17-May	15-Jun	29-Jun	13-Jul	27-Jul	10-Aug	24-Aug	07-Sep	21-Sep
1.0	7.9	8.2	9.6	6.9	8.6	8.7	10.3	8.8	8.5	10.0	8.1
2.0	7.7	8.2	9.9	6.6	8.6	8.7	10.5	8.9	7.9	10.1	8.0
3.0	7.6	8.2	10.0	6.6	8.3	8.7	9.0	7.4	6.0	10.0	8.0
4.0	7.5	8.1	9.9	6.5	7.1	8.4	7.5	6.1	5.4	10.0	8.0
5.0	7.4	8.1	9.9	6.4	5.6	5.3	5.6	5.7	5.0	10.0	8.0
6.0	6.9		6.5	6.3	3.3	1.5	3.2		4.4	9.2	8.0
7.0	6.5										

5.0 mg/L DO in epilimnion (upper level) - minimum for fish survival in Illinois
≤ 2.0 mg/L DO in hypolimnion (lowest level) - Phosphorus released from sediment

2026 – Dissolved Oxygen values were very good throughout the summer; beneficial for fish and the health of the lake

Phosphate & Phosphorus





- **Phosphorus** - element most likely causing plant production & algae
- **Lk Cty Median 0.060 mg/L @3'**
- **Ill Standards 0.050 mg/L**
- **External load** - fertilizers, agriculture, leaking septics, feces, plant decomposition, rocks, & urban areas
- **Internal load** - decades of accumulated external load settled into sediment
- **Phosphate** PO_4^{-3}

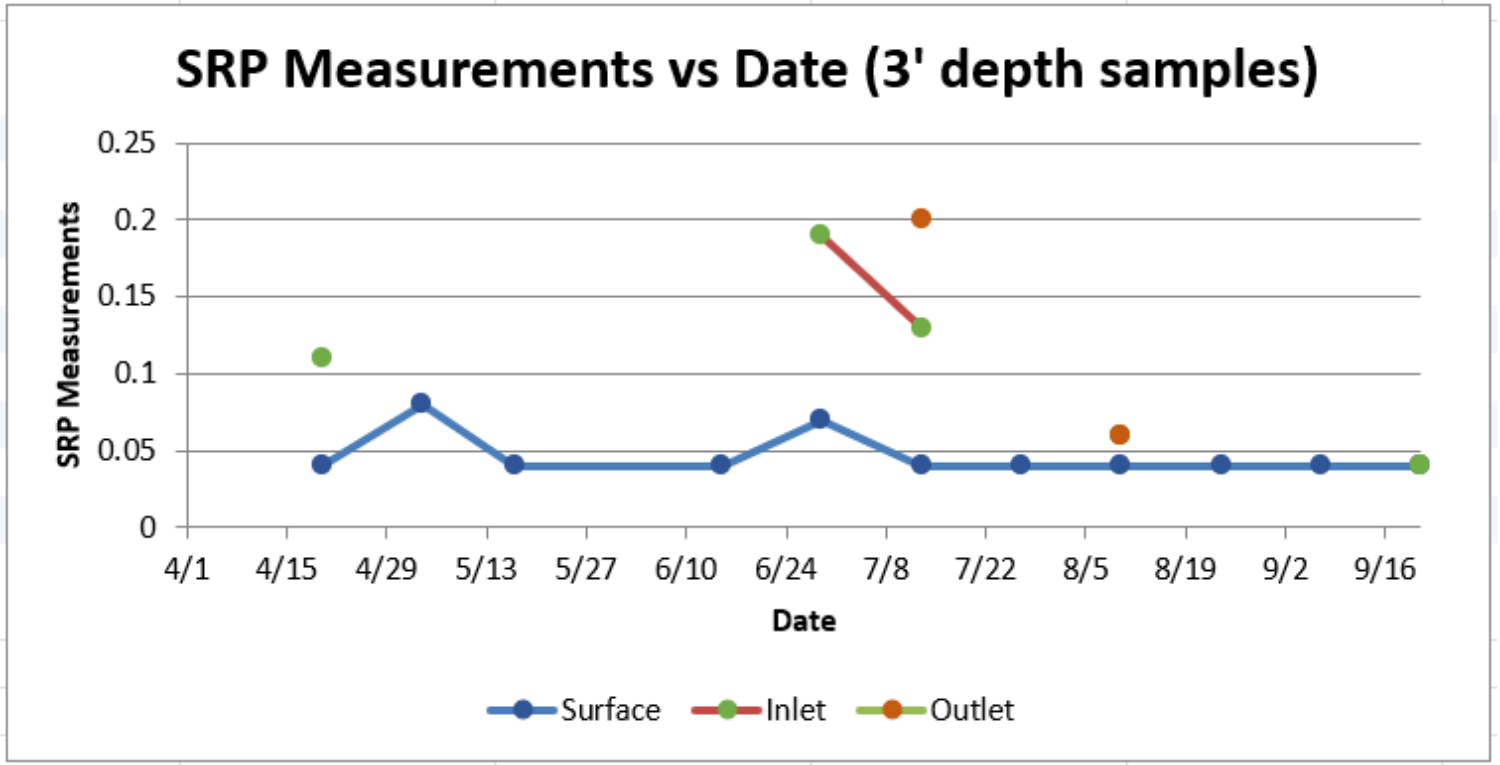
  >0.294 mg/L hypereutrophic,

  0.073-0.294 mg/L eutrophic, & nuisance algae

  0.037-0.073 mg/L mesotrophic

  <0.031 mg/L oligotrophic

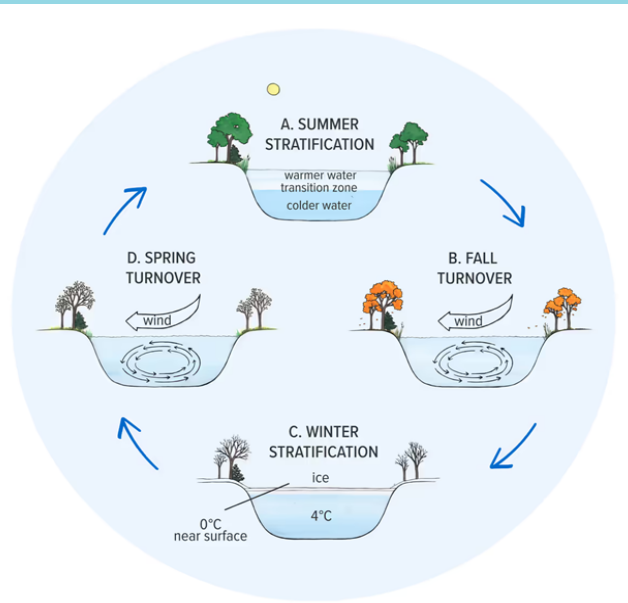
  (Note: Values < 0.05 defined as 0.04)



2026 – Phosphate values have been at or below the Lake County median

Water Temperature

- **Water Temperature** measure Kinetic Energy (molecular motion), and vary with air temperature, sunlight, depth, water density, seasonal stratifications & turnovers
- **Fall turnover** occurs around 50-60ºF water temperatures
- **Cold water** holds more DO than warm water
- **Wind, Aeration, & Motor Boats increase mixing** and modify temperature & dissolved oxygen patterns

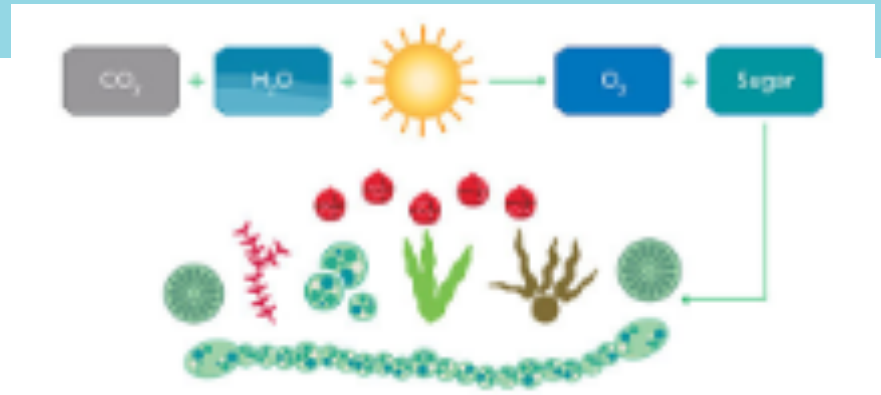


Depth (ft) \ Date	20-Apr	04-May	17-May	15-Jun	29-Jun	13-Jul	27-Jul	10-Aug	24-Aug	07-Sep	21-Sep
1.0	59.1	59.2	71.1	74.1	77.5	82.6	81.4	79.5	78.6	78.4	67.7
2.0	59.0	59.1	70.5	73.9	77.0	82.6	81.4	78.6	76.6	78.5	67.7
3.0	58.4	59.1	70.0	74.0	76.2	82.6	80.2	77.9	75.8	78.5	67.7
4.0	58.0	59.1	69.4	73.9	74.9	82.6	79.0	77.6	75.5	78.4	67.7
5.0	57.8	59.1	69.4	73.9	74.5	82.1	77.8	77.1	75.4	78.4	67.7
6.0	57.5		66.3	73.7	74.1	81.4	77.5		75.0	78.3	67.7
7.0	57.5										

- **> 88°F can be stressful to fish; 90-95°F high mortality**
- **Different fish** prefer certain temperature ranges

2026 –Temperature values are similar from surface to sediment. Loch Lomond is Polymictic - Constant Mixing with very slight stratification

Chlorophyll-a



- **Chlorophyll-a** is a pigment in living cells of algae & other phytoplankton in surface water
- **Chlorophyll-a indicates** an abundance of microscopic phytoplankton & algae growth
- Lk Cty Median ~40 µg/L @3'

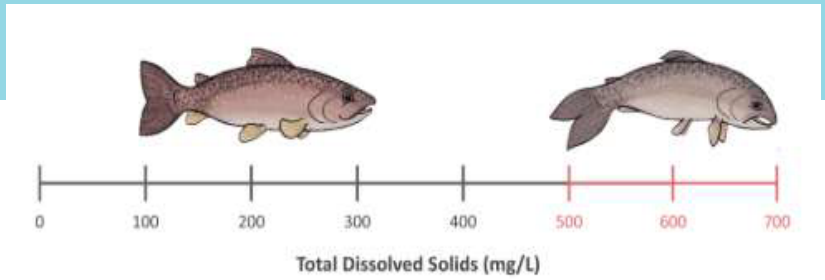
Depth (ft) \ Date	20-Apr	04-May	17-May	15-Jun	29-Jun	13-Jul	27-Jul	10-Aug	24-Aug	07-Sep	21-Sep
1.0	0.00	2.90	8.55	1.21	3.29	4.55	2.10	2.28		15.89	0.00
2.0	0.34	3.67	9.68	1.02	3.90	5.36	2.33	2.87		14.18	0.00
3.0	3.37	6.86	9.80	0.80	5.05	5.87	3.14	4.39		13.52	0.00
4.0	4.80	8.76	11.64	1.31	10.21	5.56	4.14	3.36		15.08	0.00
5.0	4.19	7.31	10.80	1.19	12.75	8.20	3.44	1.38		18.16	0.00
6.0	0.00		11.82	3.16	19.84	9.18	6.85			17.67	0.00
7.0	14.43										

- 0-10 No problems
- 10-20 Algae & discoloration
- 20-30 Nuisance conditions
- >30 µg/L Severe conditions & discoloration

- <2.0 µg/L = oligotrophic
- 2.0 - 6.0 µg/L = mesotrophic
- 6.0 - 40.0 µg/L = eutrophic
- >40.0 µg/L = hypereutrophic

2026 – Chlorophyll-a values were mostly limited algae, except in early September

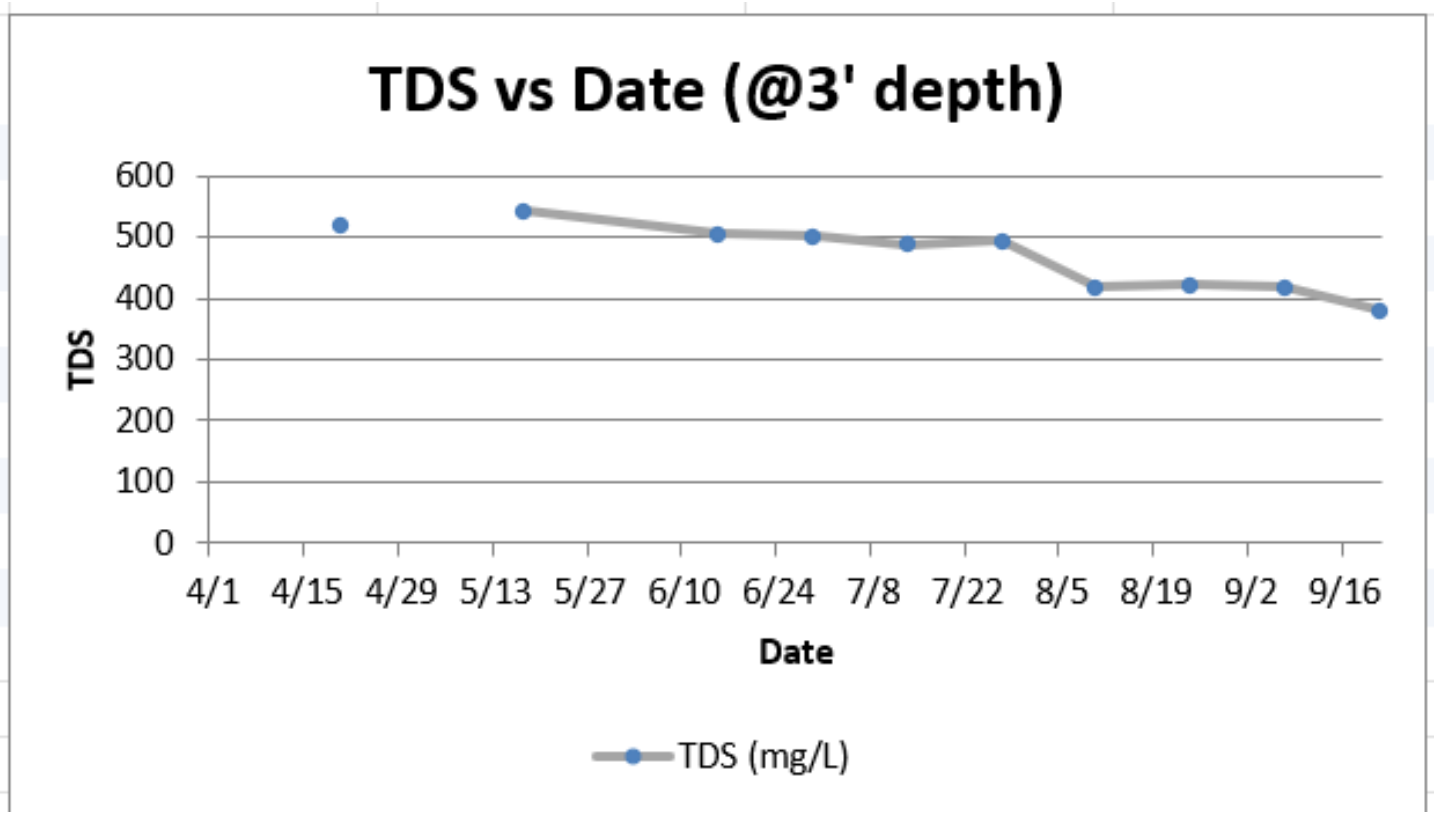
Total Dissolved Solids



- **Total Dissolved Solids TDS** are salt components (anions & cations) dissolved in water, e.g., Na^{+}, Ca^{+2}, SO_4^{-2}, PO_4^{-3}
- **Lk Cty Median = 454 mg/L @3'**

- ***17-30*** *Unpolluted*
- ***50-250*** *Healthy*
- ***>400 Polluted***

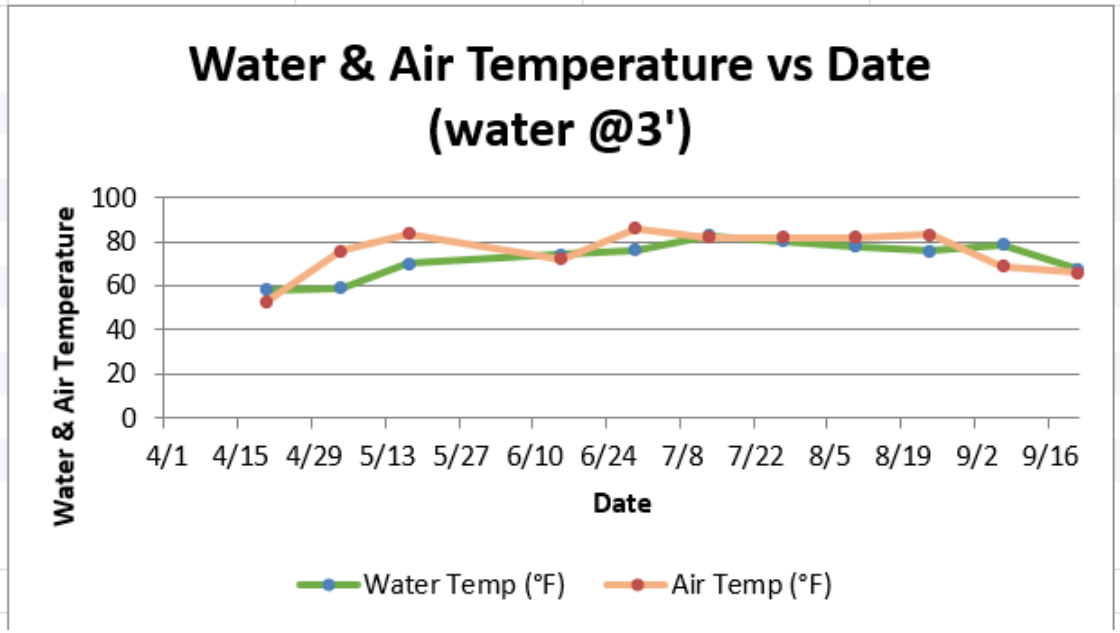
- ***<25*** *Oligotrophic*
- ***25-250*** *Mesotrophic*
- ***250-400*** *Eutrophic*
- ***>400 Hypereutrophic***

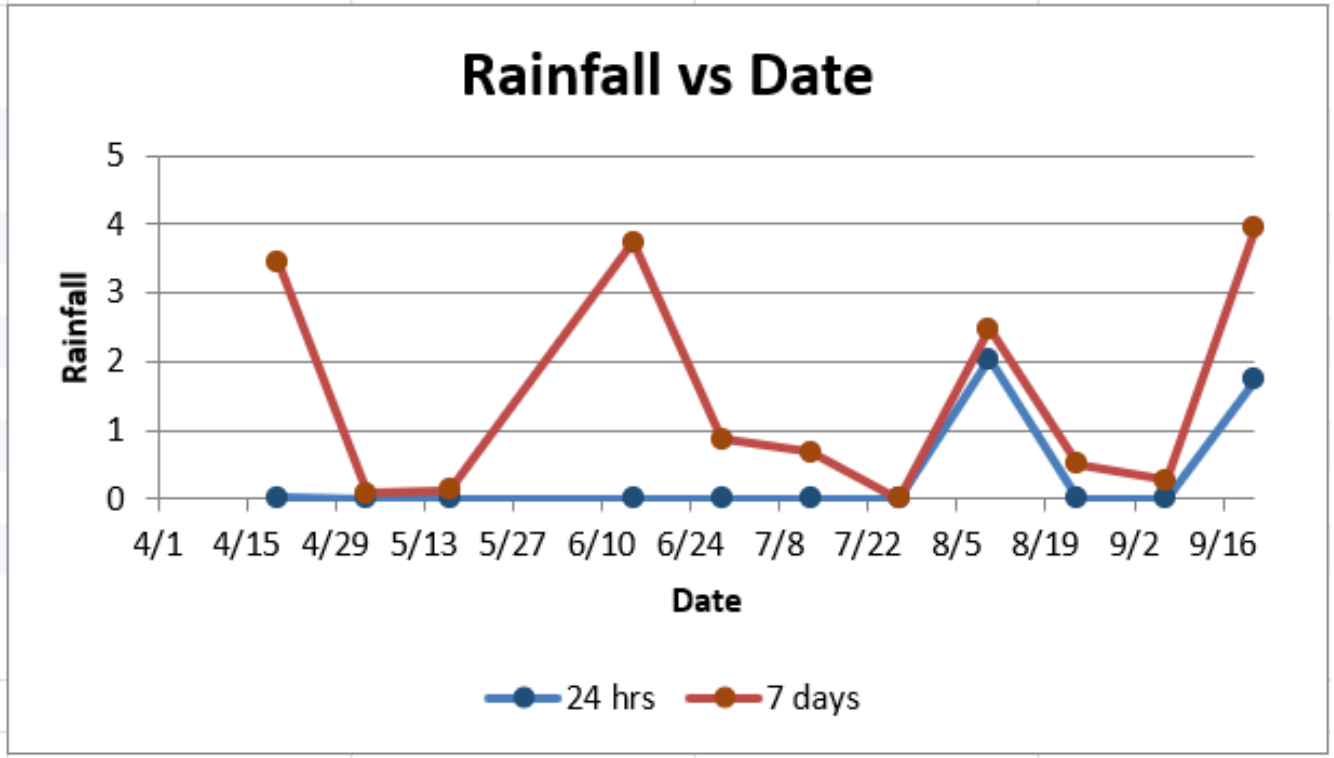


2026 – TDS values dropped during the summer, but are still considered polluted and hypereutrophic

Weather

- Weather data includes rainfall, high and low temperatures, wind speed and direction.
- Weather data recorded – 24 hours & 7 days before each monitoring date



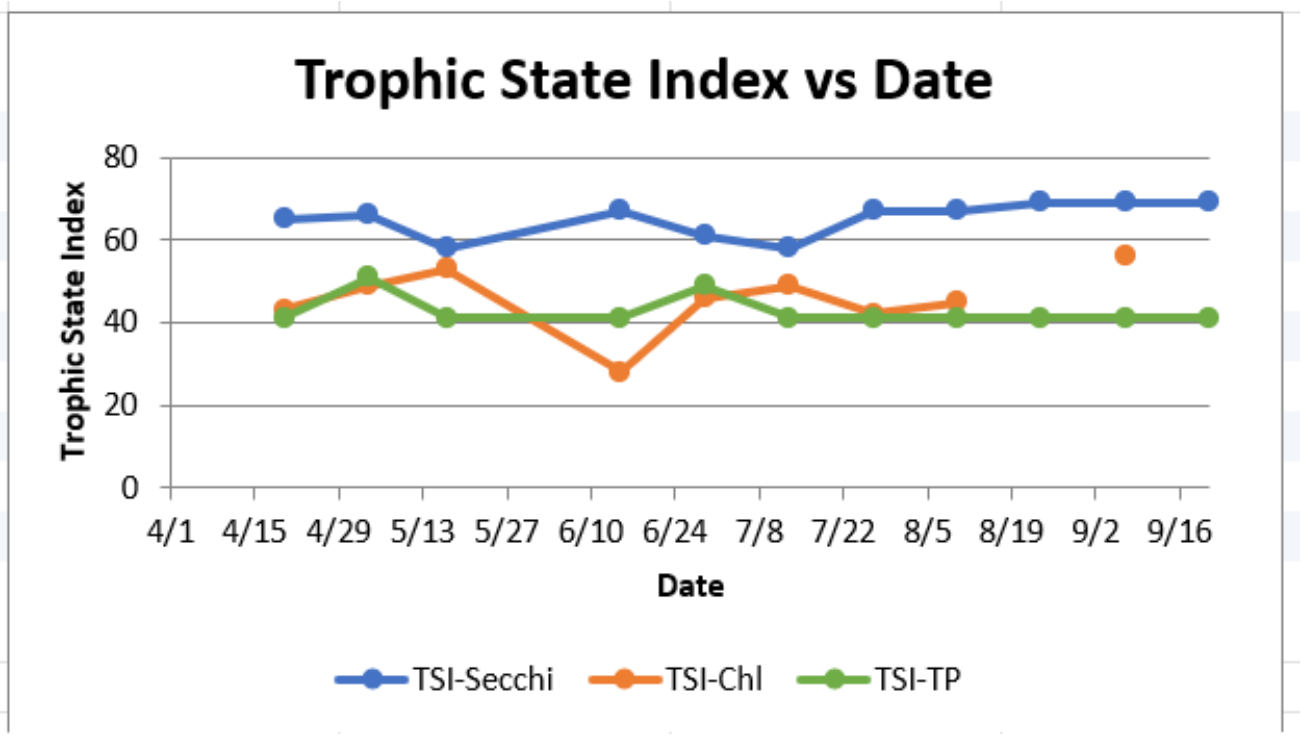


2026 –

- Mid-July was the peak temperatures
- Rainfall events were "feast or famine" producing lake levels 6-10" above normal.

Trophic State Index

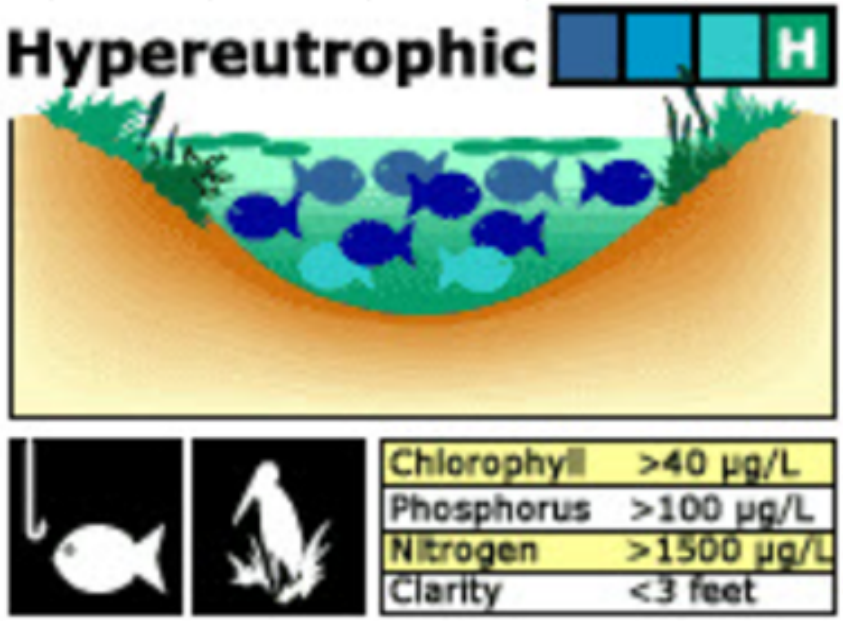
- **Trophic State Index TSI** - Biological Productivity or amount of algal & plankton biomass
- **Numerical scale 0 to 100**
  - **higher # - very productive; eutrophic**
  - **Lower # - less productive; oligotrophic**
- **TSI measurements**
  - **Secchi depth – *best with our data***
  - **Chlorophyll-a**
  - **Phosphorus**

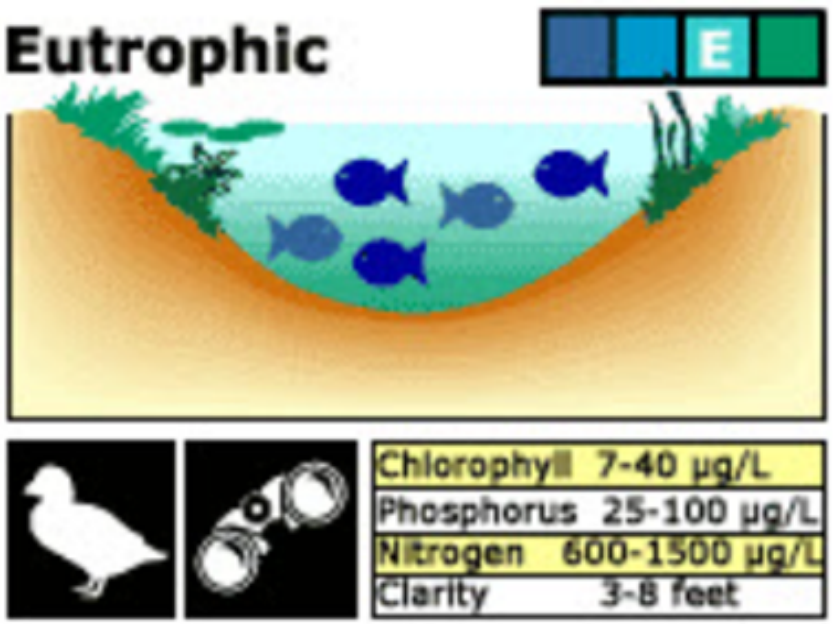


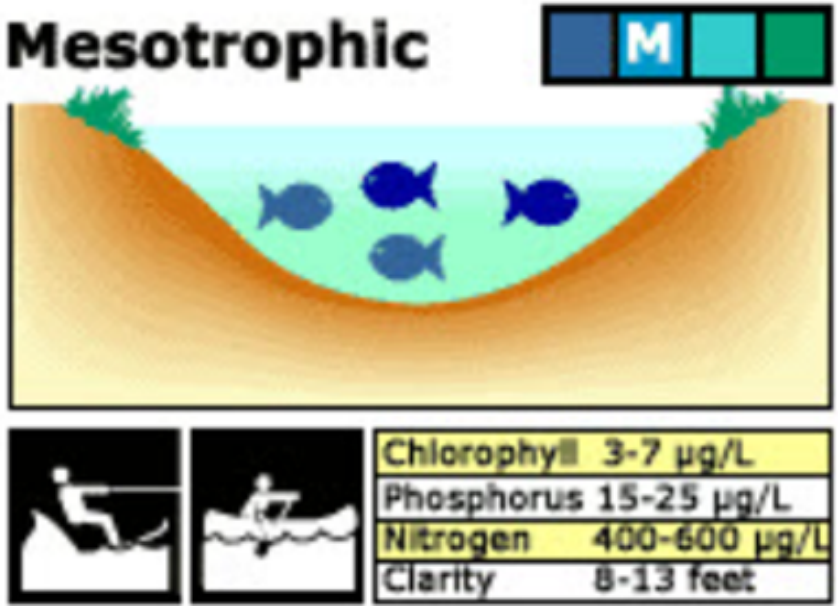
Trophic State	
Hypereutrophic	70-100
Eutrophic	50-69.99
Mesotrophic	40-49.99
Oligotrophic	<40

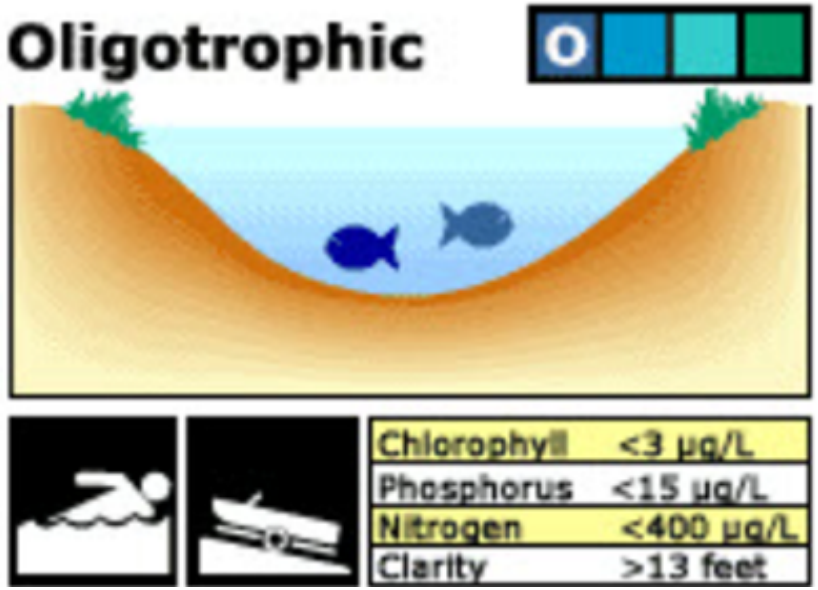
2026 – TSI measures range from Eutrophic to Mesotrophic depending on the parameter. TSI-Secchi indicated Eutrophic conditions, borderline Hypereutrophic.

Trophic State Index









TSI - Biological Productivity

- Hypereutrophic & Eutrophic are better for fishing, wildlife, & plants but less desirable for swimming and boating.
- Mesotrophic & Oligotrophic are better for water sports, but less for wildlife & plants.
- *What is our balance?*

Key Actions – *Geese Deterrents*



- *Goose Poop - source of phosphorus increases algae blooms poor water quality, E. coli, Salmonella*
- *1 Goose: 2-4 pounds per day; Annually up to… 1.4 lbs. Phosphorus = 700 lbs. Algae!*
- 10 Floating Lights - blink dusk to dawn deter nesting
- Shore Fencing & Buffer Zones– deter access
- Beach Closures Reduced
  - **2019** - 19 closures due to e-coli; 50+ geese
  - **2023-2024 -** closures & geese decreased
  - **2025-2026 -** 0 -5 closures & one family of 7 geese!



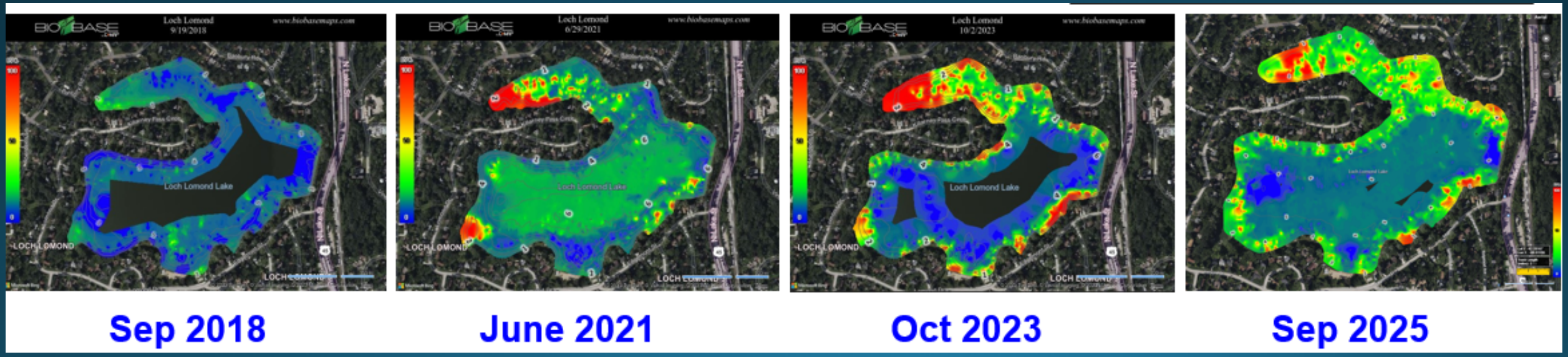
Key Actions – *Buffer Zone Demonstration Areas*

- **Buffer Zone -** Native shoreline plants & deep-rooted grasses filter out fertilizers, slow stormwater runoff, & block geese. Most cost-effective method.
- **Demonstrations areas** with informative signage model effective lake management practices.



Key Actions – *Increase Aquatic Plant Coverage*

- **Submerged Plant Coverage -** Heat maps by LCHD-ES show steady improvement! Increased green is good
- **Chemical Spraying -** only once per year for curly-leaf pond weed
- **St. Marys Lake** downstream noticed an increase in plant coverage



Key Actions – *Weed Harvesting*

- **Removes plant biomass** - polluting nutrient if left to rot at the bottom of the lake
- **Weed Harvesting** – remove plants from surface to 1' below
  - **2024**: 164 trailers, ~246,000 lbs.
    2025: 288 trailers, ~432,000 lbs.
    2026: 88 so far, ~132,000 lbs.
- **Improves boat access**





Key Actions – *Carp Removal*

- **193 Carp removed since 2023**
  - ***Thank you***, Lake County Health Department – Environmental Services!

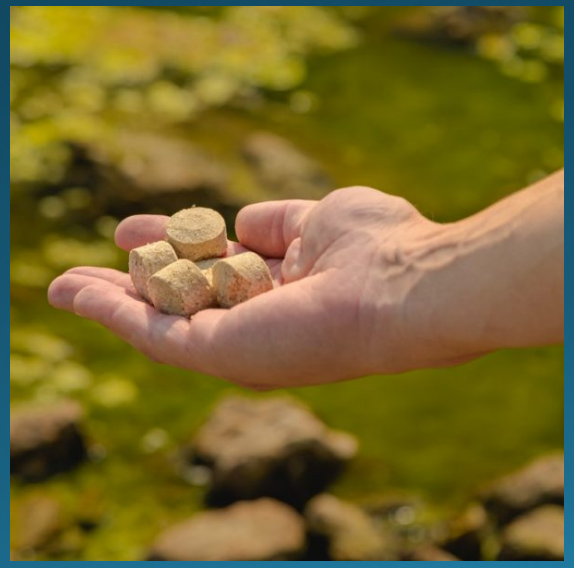




Key Actions – *Bio-Dredge Applications*

- **Bio-Dredge** - bacteria & digestive enzymes designed to naturally decompose **organic sediment** or "muck"
- Loch Lomond averaged 2-6 inch reduction per year in specific areas treated and monitored
- LLPOA & residents purchased & distributed pellets & 6 lb. blocks







Key Actions – *Educate & Inform Community*

Increased LLPOA social media information, increased activities, & increased participation!

Website information:

- Aquatic Plant Islands
- Biodredging and Loch Lomond
- Buffer Zones for Lakes & Wetlands
- Deterrents for Geese & Beavers
- Eco-Friendly Lawn Care Ideas
- Homegrown National Park
- Loch Lomond History via Maps 1840-2022
- Loch Lomond Storm Sewers - Where Do They Go?
- Native Plants List
- Phosphorus-Free Fertilizers
- Planting Next Generation Trees
- Plants for Pollinators
- Rain Gardens
- Water Testing 25 Year Summary
- Water Testing Parameters
- What's the Muck?

Key Actions – *2015 LCHD-ES Recommendations*

LLPOA Lake Committee has addressed every Recommendation:

- Spray for Curly Leaf Pondweed Early Spring, then Bi-Weekly Weed Harvesting
- Bio-Dredge applications to reduce organic sediments
- Geese Deterrents - Fencing, Buffer Strips, Monitor Geese, Lights
- Monitor Water Clarity Secchi Readings
- Test For Dissolved Oxygen & Phosphorus
- Floating Aquatic Plant Islands Relocation
- Educate & Engage Residents
  - Monthly Committee Meetings, Informative emails, Social Media Posts
  - Lake Management Sponsored Events
- Water Circulation - Monitor & Add
- Carp Reduction
- Non-Invasive Plants - Increase Coverage & Variety Of Native Plants
- Collaborate & Research Share Successful Strategies With Other Lake Groups
- Control Run-Off - Work With Village Of Mundelein

Looking forward to the 2026 LCHD-ES Observations Recommendations

