

Review of  
Sarah's Pond  
Oxygen  
Demonstration  
Project

NOV  
2023



Orleans Pond Coalition

Advocating for Clean Waters Since 2003

# ORLEANS POND COALITION

Founded 2003

Coalition of Pond Groups, Neighborhood Associations, Businesses and  
Individuals sharing a love of Orleans Waters

Education and advocacy

Focus on improving waters through a comprehensive wastewater plan  
to include marine and fresh waters

Identify additional approaches to freshwater pond remediation

# OPC Goal:

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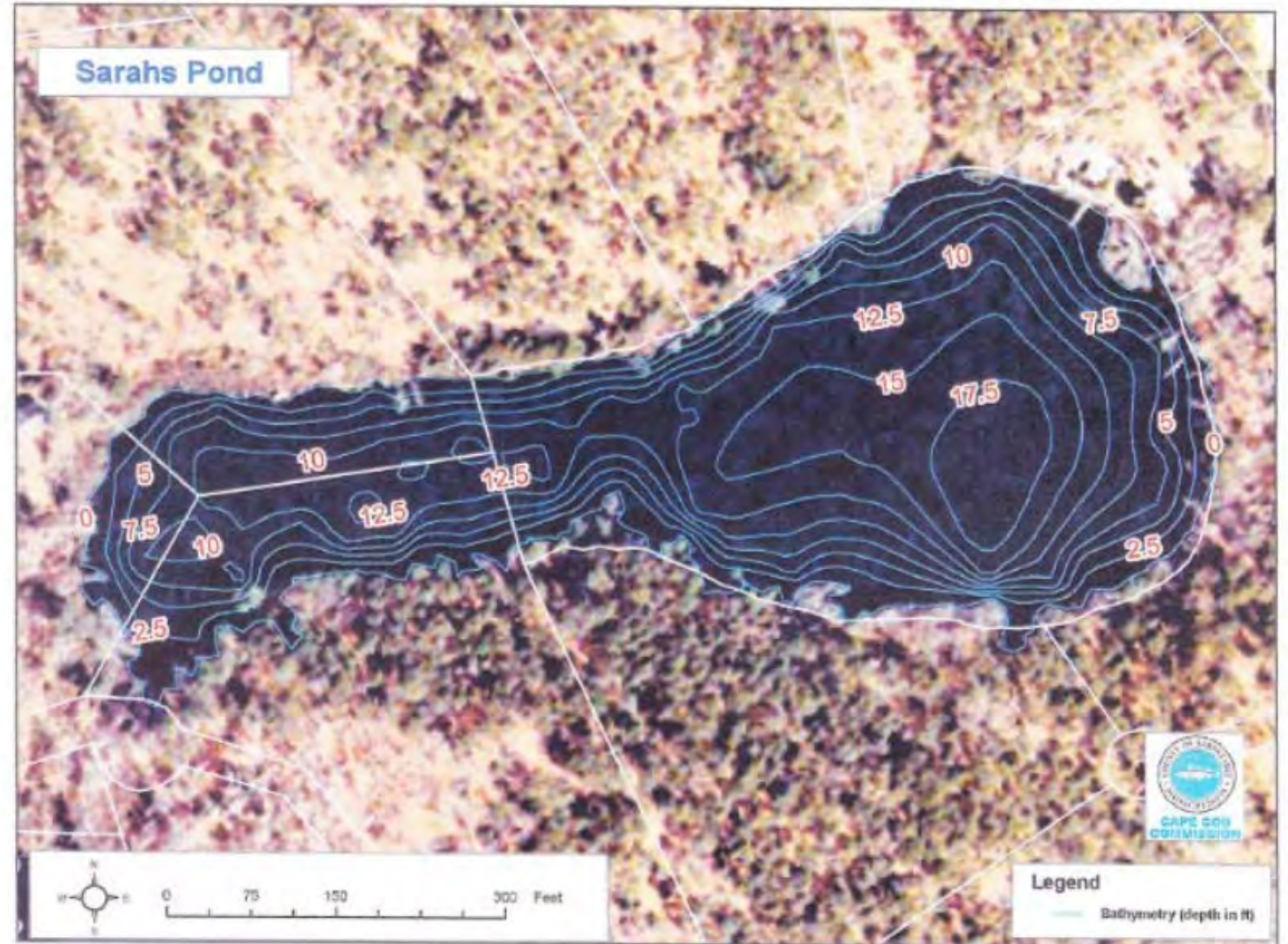
- **Determine if a more sustainable alternative exists for remediating distressed freshwater ponds.**
- **Current Alternatives:**
  - Alum
  - Dredging
  - Bubble Aerators
- **Sarah's Pond in Orleans is our test site.**
  - Recent HAB's
  - Few external sources for nutrient release into the Pond.



# Sarah's

- 5.8 acre kettle pond
- Elongated.
- Two basins
  - basin #1 (wide section) 17 ft
  - basin #2 13 ft
- Few external factors –
  - 1 upgradient abutter
  - minimal stormwater
  - No fertilizers/pesticides

Figure 2. Sarah's Pond bathymetry



# Monitoring: April to October

Every 1-2 weeks:

- Dissolved oxygen, mg/liter oxygen, temperature
- Sechhi clarity & turbidity
- Algae samples
- Weather, visual observations

Monthly:

- Nutrient samples

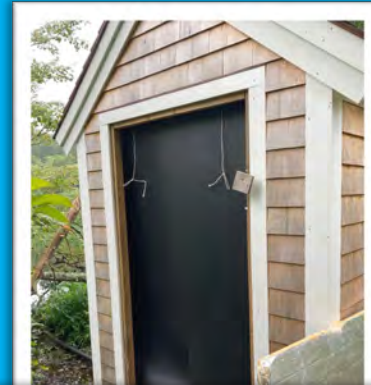
2018: Baseline Data

2019 & 2020: Nanobubble Technology

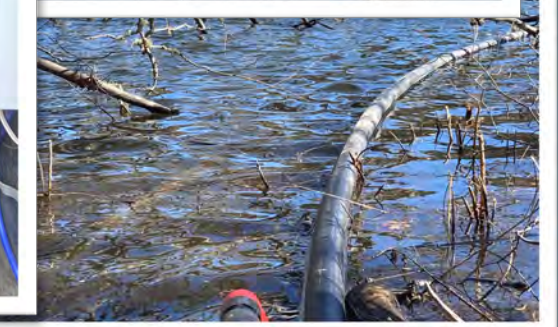
2021, 2022, & 2023: Oxygen Saturation Technology (OST)

# Key OST Equipment

- 2hp pump
- 4" PVC pipes to/from pond basin
- Intake & Discharge Headers
- Oxygen concentrator – 'Topaz'
- Cooling Fan for Topaz
- Twin tower to dissolve oxygen
- Data sensors at 4 layers in water column,
  - Bottom (~17')
  - Above equipment (~15.5')
  - Mid layer (~13')
  - Below surface (~8.7')
- PLC to control equipment function
  - On when DO below 5mg/L
  - Off when DO above 8mg/L
- Telemetry to monitor remotely



Dr. Paul Gantzer Leading  
Equipment Startup,  
April 2023



# Status

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- 6<sup>th</sup> year of program (3<sup>rd</sup> w/OST)
- 2023 - Best results
- 2022 OST upgrades to equipment eliminated most of the earlier challenges. Measurably lower Cyanobacteria.
- Equipment more robust.
  - Larger intake and discharge pipes
  - Telemetry
  - PLC - Process Logic Controller
  - Auto Circuit Breaker Reset
  - New insights on maintenance schedule
- Final report to be issued Dec 2023.

**Sept 2023: Good Oxygen Levels at sediment;  
No Algal Bloom through summer**



**Aug 2021:  
Significant Algal Bloom**



September 15, 2023





# COSTS

- POND ASSESSMENT AND PERMITTING: \$ 7,200
- EQUIPMENT COST: 28,500
- EQUIPMENT UPGRADES: 1,500
- AVERAGE ANNUAL ELECTRICAL: 2,800
- ANNUAL MAINTENANCE: 1,500

## Takeaways...

- No negative impact to Wetland Resources or Interests (“streamlined permitting” OK)
- Cyanobacteria blooms suppressed if equipment reliable
- Pond “health” improved

