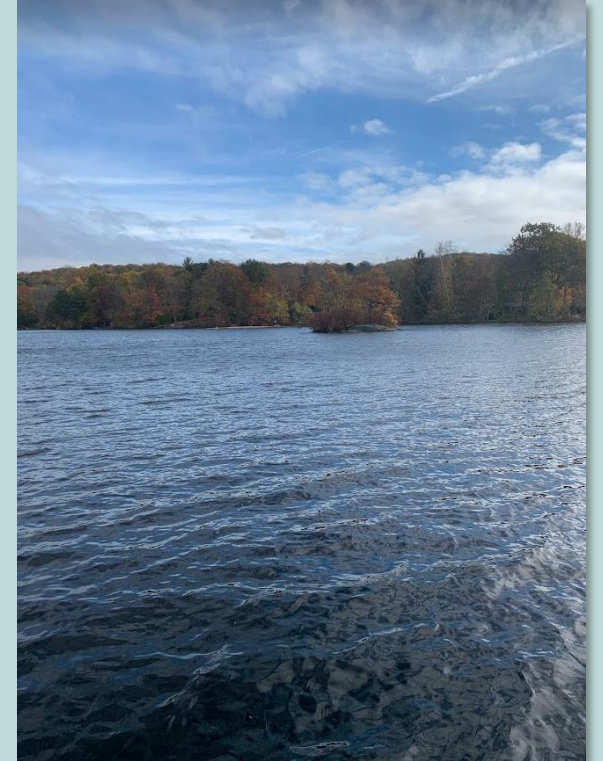


# Roaring Brook Lake: Water Quality Monitoring and Management Update



Alejandro Reyes  
Certified Lake Manager  
Northeast Aquatic Research LLC

# Outline

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- Management History
- 2021 Monitoring Overview
- Managing HAB's
- Septic System Maintenance
- Stormwater Management
- Moving Towards 2022



# Management History

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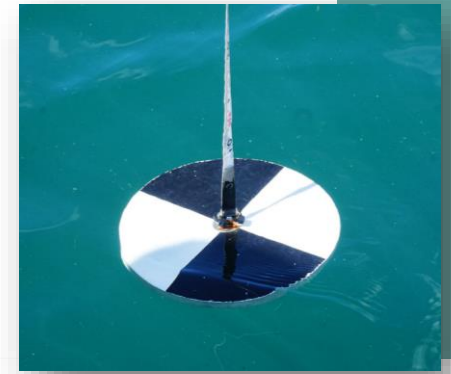
- NEAR has been working with the Town of Putnam Valley on Roaring Brook Lake since 2019
- Project Manager: AJ Reyes, Certified Lake Manager
- Completed work for the lake:
  - Monthly water quality monitoring
  - Detailed watershed investigation looking for poor stormwater practices
  - Sediment sampling and internal load determination
  - Aquatic plant survey - 2019
  - Fisheries survey – 2020
  - Multiple on-call site visits to the lake.
- NEAR conducts ongoing monitoring of Roaring Brook's water quality and provides management advice and guidance to the RBLPOA and the Town of Putnam Valley.



# 2021 Monitoring Results



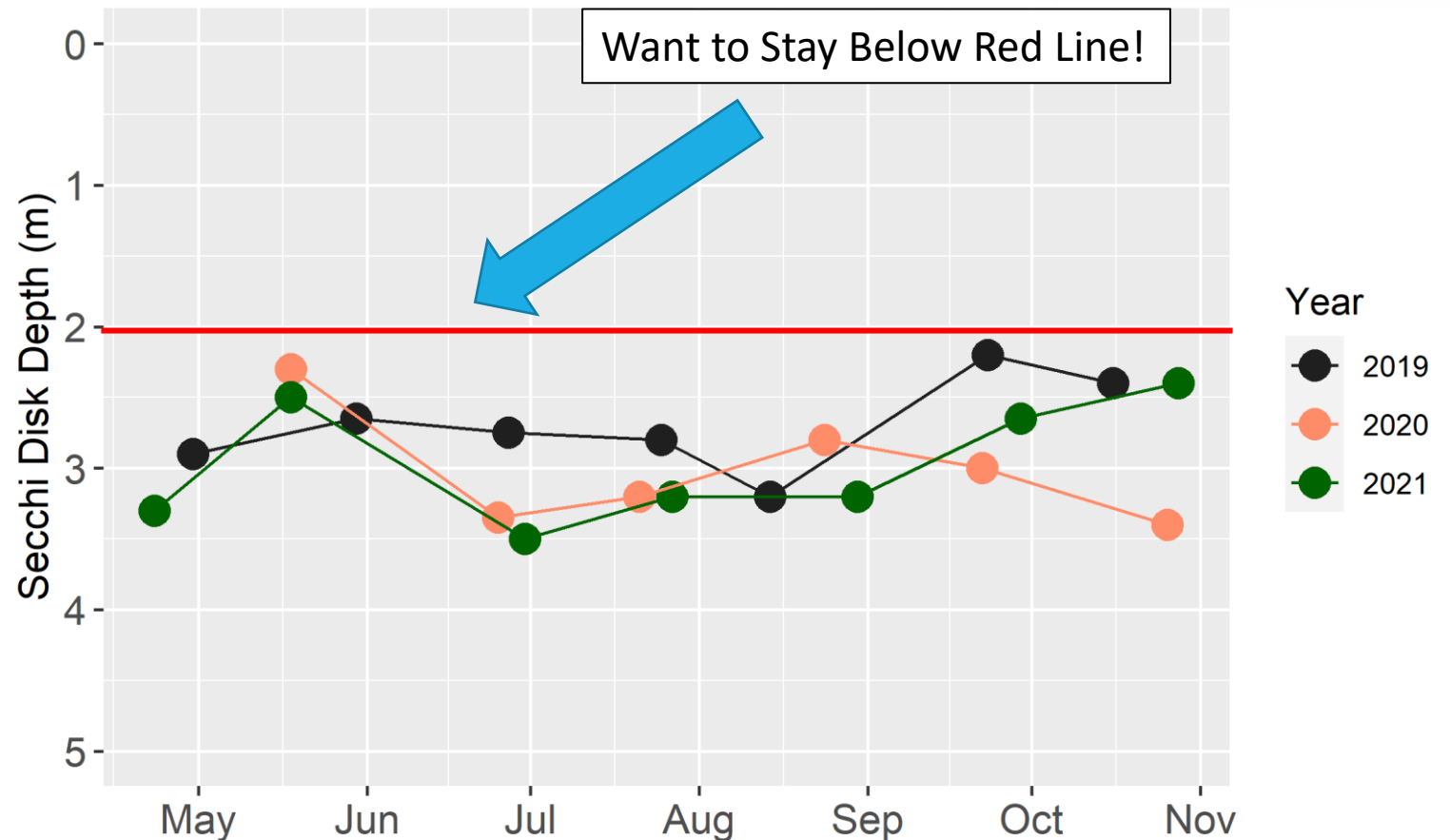
# Water Clarity



The measure of water transparency

**Higher Secchi depth value = Lower algae abundance**

2021 measurements considered good, with multiple readings below 3 meters!



# Dissolved Oxygen

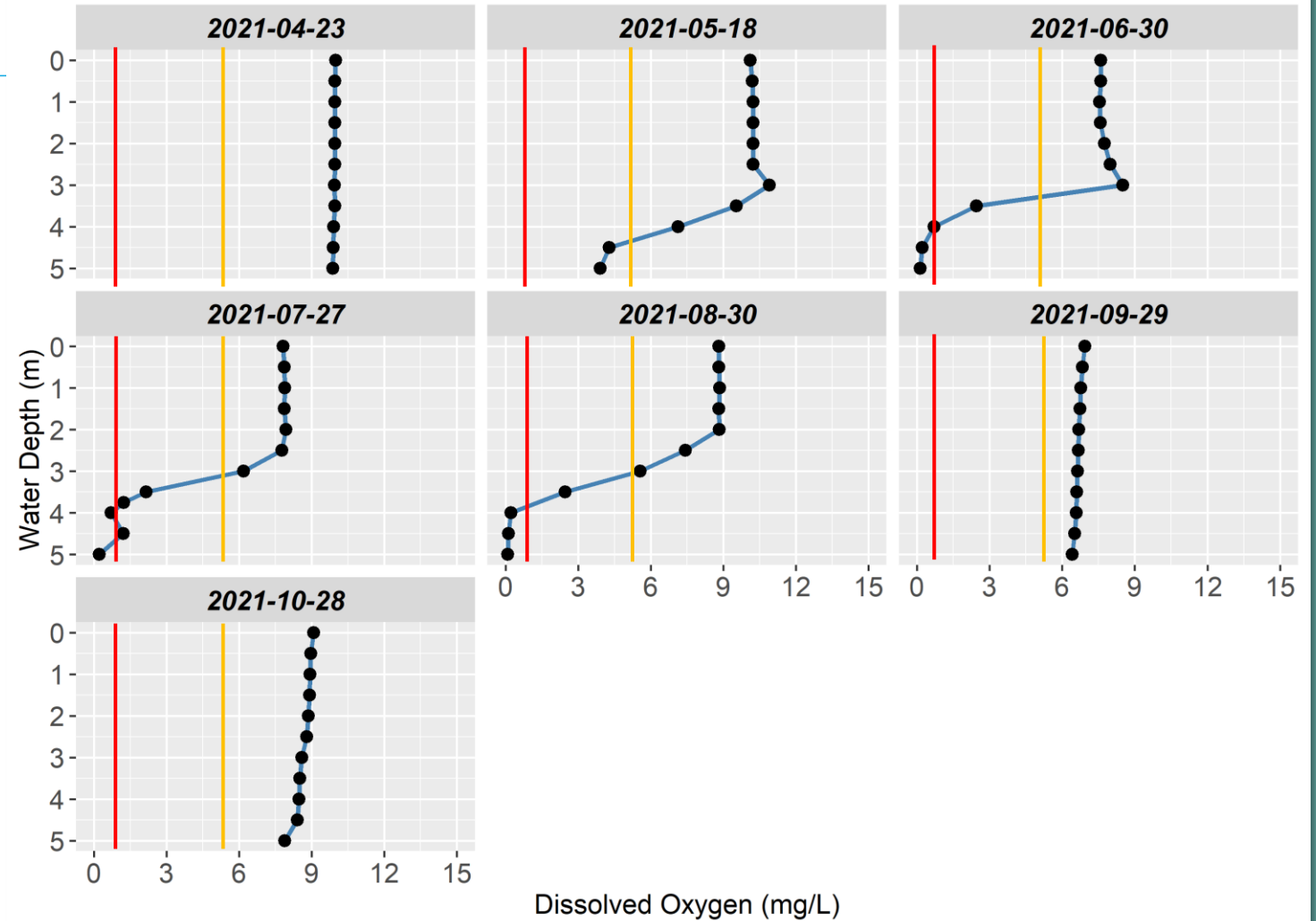
Key parameter linked to many lake functions

Supporting most organisms > 5.0 mg/L  
(Orange Line)

Stopping the internal release of nutrients > 1  
mg/L (Red Line)

Termed: **Anoxia**

Dissolved oxygen concentrations were acceptable in surface waters, but declines to no oxygen conditions were documented.

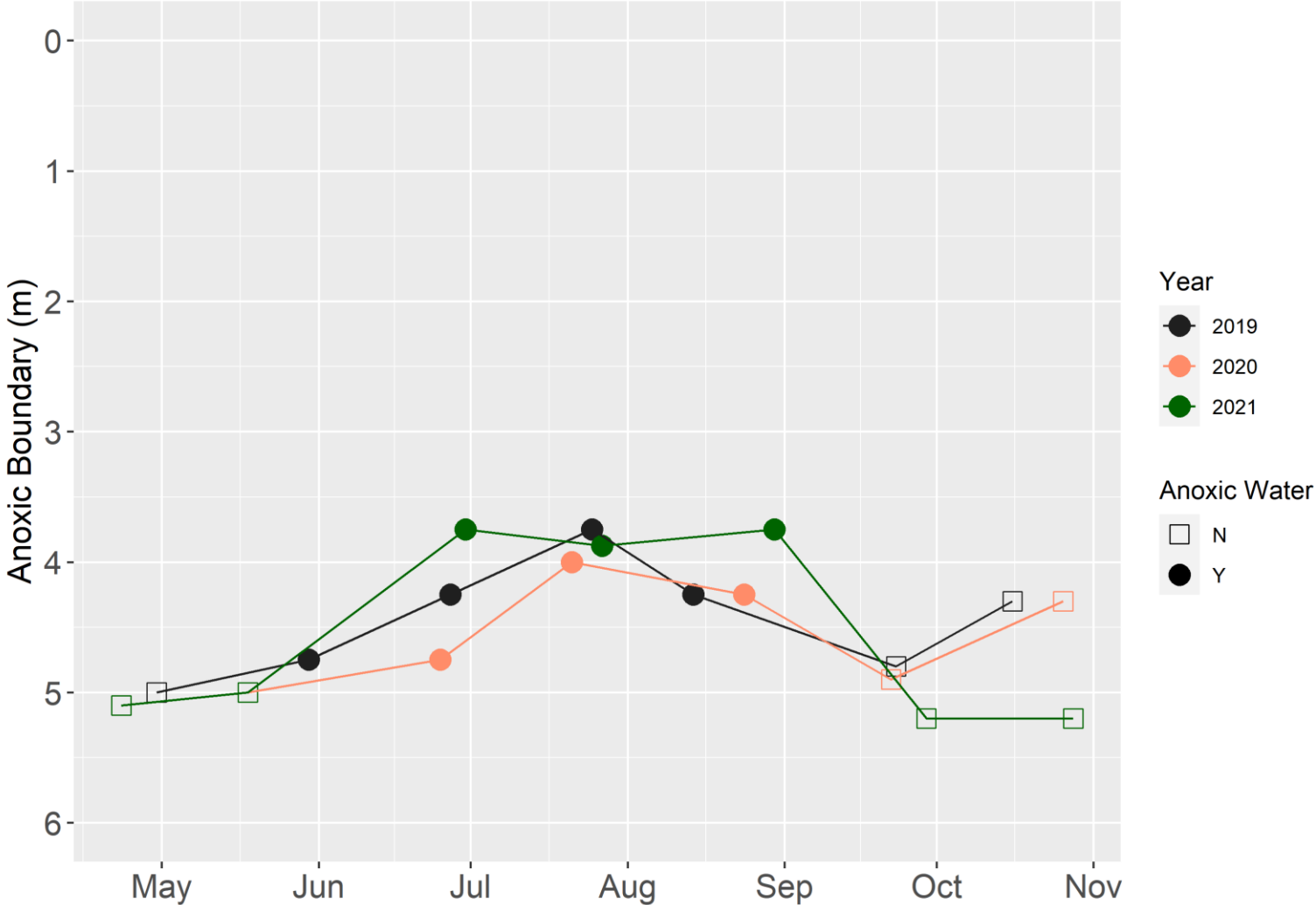


# Anoxic Boundary

Boundary of no oxygen conditions

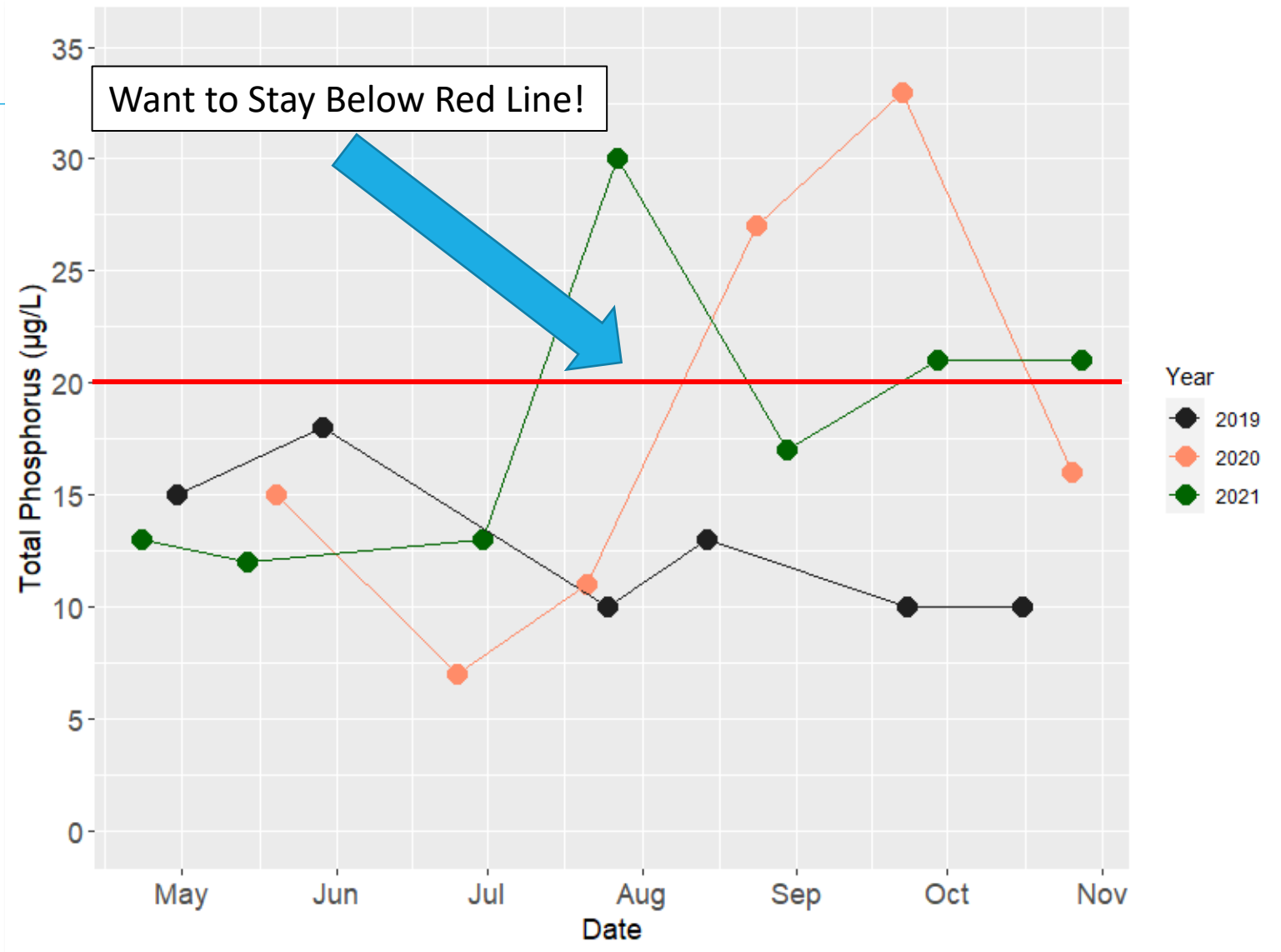
**Shallower depths = more expansive anoxic conditions**

2021 Anoxic boundary higher than in past years in June and August and consistent with past years in August.



# Total Phosphorus

- Total phosphorus is the key nutrient regulating algae growth in NE lakes
- Naturally present in small amounts
  - Human influences increases concentrations
- Lakes should stay below 20 ppb to avoid frequent and consistent algae blooms
- 2021 phosphorus values were acceptable in early season, but increased as the season went along.







May 16<sup>th</sup>, 2021



September 29<sup>th</sup>, 2021



June 4, 2022



# Summary

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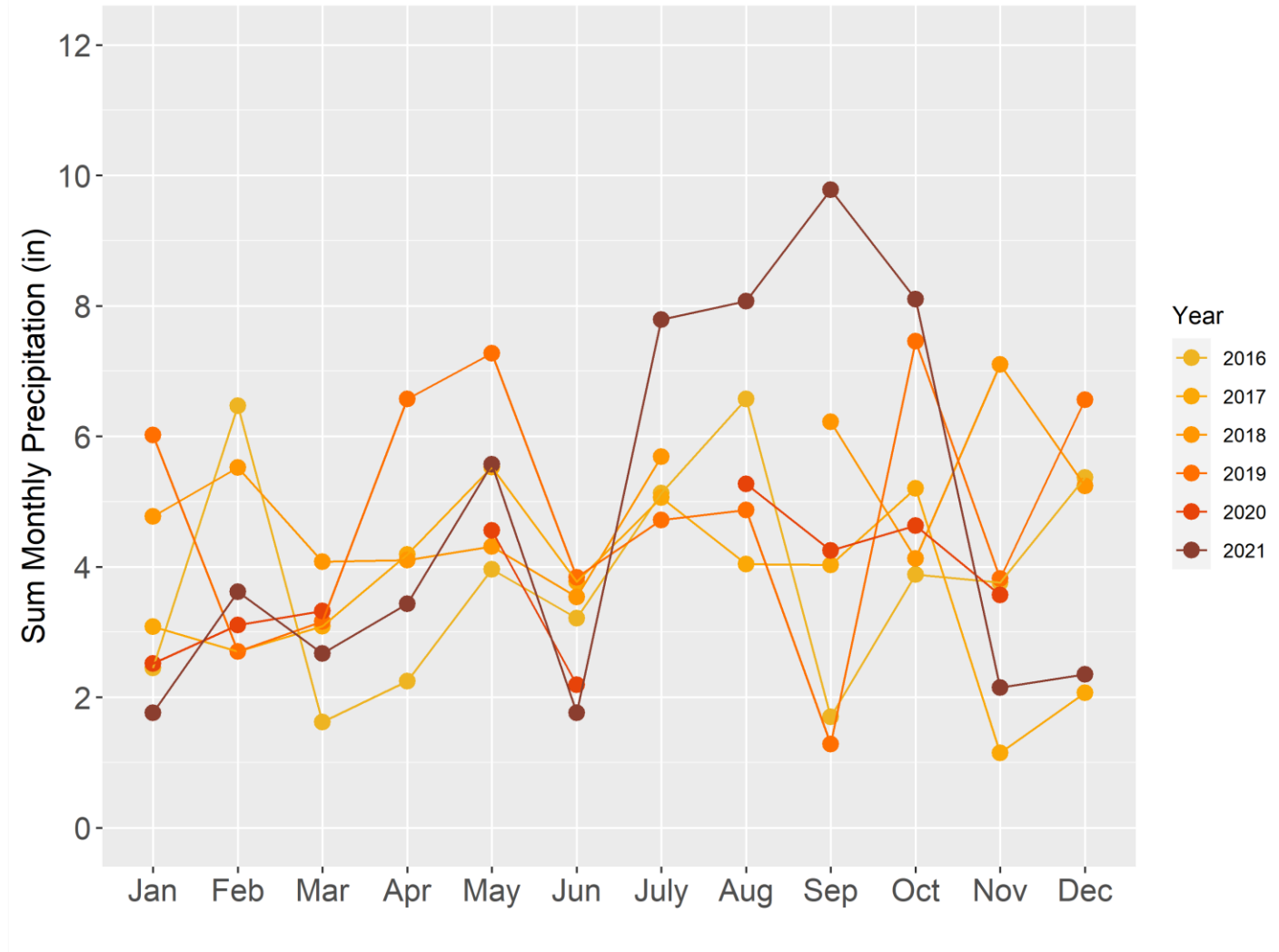
- Water clarity measurements indicate low algae abundance throughout season
  - Supported by low cyanobacteria cell counts in open water.
- Dissolved oxygen in the surface waters is sufficient for all organisms, but declines at deeper waters
  - Oxygen decline similar to past years, with more severe conditions observed in June and August
- Total phosphorus values are acceptable in the beginning of the year, increasing towards the end.
  - Similar to previous years.

**Overall, Roaring Brook Lake's Water Quality is Acceptable for Most Desired Uses**



# Precipitation in 2021

- 2021 precipitation amount was extremely high!
- June was driest month since 2016
- July-October were the wettest months since 2016
- Heavy rainfalls have significant effects on lakes
  - Moving more water through lake
  - Lowering overall temperature of lake
  - Increasing in-lake nutrient concentrations



# Managing Harmful Algae Blooms

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- Currently, harmful algae blooms are infrequent, localized events most often observed on shorelines.
  - Driven by wind patterns
- NEAR at this time **DOES NOT** recommend large scale interventions to manage harmful algae blooms
  - Algaecides
  - Aeration
  - Nutrient inactivation
- There may come a time when these measures are needed, so the community should be ready for that possibility
  - Sediment testing/bathymetry helps with dosing/sizing these solutions in the future.
- Majority of the effort should be focused on the **watershed**, aimed at reducing the amount of nutrients entering Roaring Brook Lake.



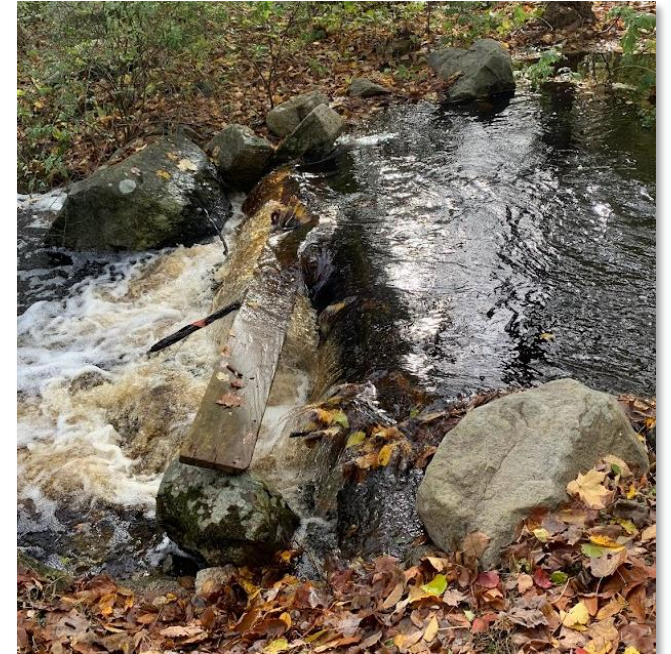
# Watershed Management: Septic Systems

- Need to keep septic systems **pumped out** on regular basis and **inspected**.
  - Important to check the condition of the leach field as well as tank!
- Lots of cesspools and 55-gallon drums instead of conventional or advanced treatment technologies.
- Small leach fields and bedrock geology hamper effluent treatment efficacy.



# Watershed Management: Stormwater

- Stormwater moves pollutants to lake rapidly
  - Larger the storm -> more sediment and nutrients enter the lake.
- Watershed is mostly forested, which helps with water retention
  - **Infiltrating water into soil is always preferable to letting it run off!**
- Frequent catch basin cleaning
- Nutrient filtering trial



# What can individual homeowners do?

- Look for places around the home where water runs freely.
- Use rain gardens/barrels to infiltrate/capture rainwater.
- Using porous pavement/pavers on driveways and other surfaces to aid in infiltration.
- Limit fertilizer use close to lake and drains and use slow-release nitrogen fertilizer when possible.
- Refrain from altering shoreline if possible.





# Children's Beach Meet and Greet!

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- I will be at Children's Beach on June 11<sup>th</sup> and September 10<sup>th</sup> in the morning.
- Goal is to answer questions about Roaring Brook Lake's water quality and management.
- All are welcome!!



**MEET & GREET**



# Questions?

