JONES POND

2022 SAMPLING HIGHLIGHTS

Station Deep

New Durham, NH

Extension

Water quality data displayed in Tables 1 and 2 are surface water measurements with the exception of the dissolved oxygen data that are collected near the lake bottom. Summary statistics are provided for monthly samples collected between May 16 and September 28, 2022.

Blue = Oligotrophic

Yellow = Mesotrophic

Red = Eutrophic

Gray = No Data

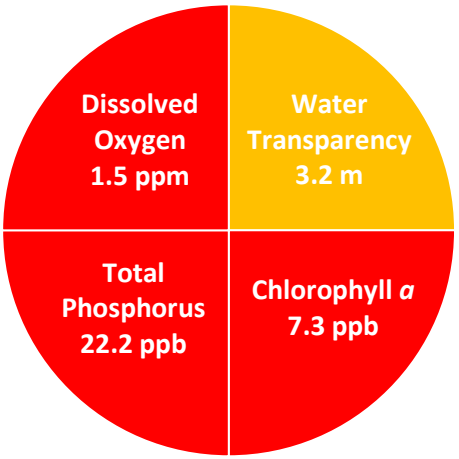


Figure 1. Jones Pond Water Quality (2022)

Table 1. 2022 Jones Pond Seasonal Averages and NH DES Aquatic Life Nutrient Criteria[1]

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Jones Pond Average (range)	Jones Pond Classification
Water Clarity (meters)	4.0 – 7.0	2.5 - 4.0	< 2.5	**3.2** meters (2.2 – 3.8)	Mesotrophic
Chlorophyll *a* [1] (ppb)	< 3.3	> 3.3 – 5.0	> 5.0 – 11.0	**7.3** ppb (4.9 – 11.0)	Eutrophic
Total Phosphorus [1] (ppb)	< 8.0	> 8.0 – 12.0	> 12.0 – 28.0	**22.2** ppb (15.0 – 22.8)	Eutrophic
Dissolved Oxygen (ppm)	5.0 – 7.0	2.0 – 5.0	<2.0	**1.5** ppm (0.2 – 3.9) *	Eutrophic

* Dissolved oxygen concentrations were measured between 3.0 and 4.0 meters, in the middle layer, on July 26, 2022.

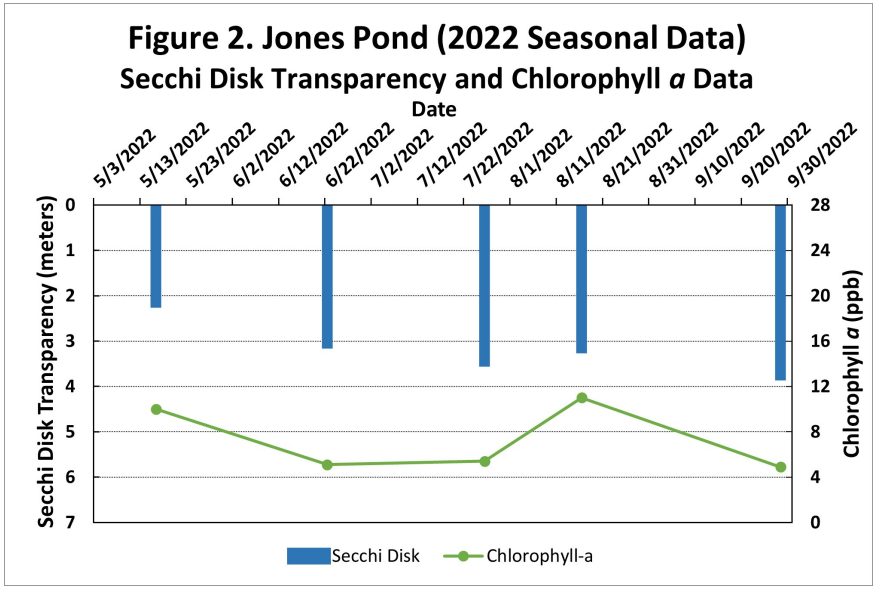
Table 2. 2022 Jones Pond Seasonal Average Accessory Water Quality Measurements

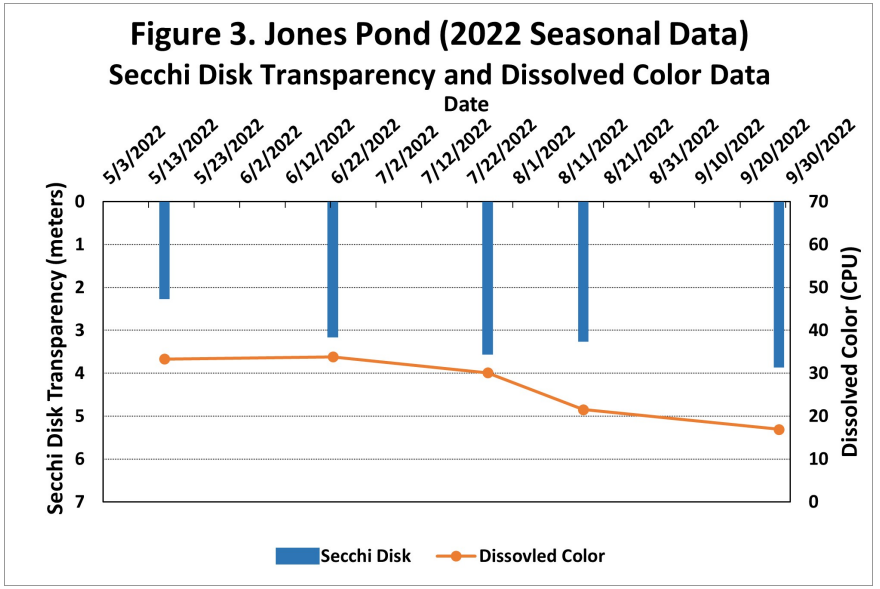
Parameter	Assessment Criteria					Jones Pond Average (range)	Jones Pond Classification
Color (color units)	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored	**27.1** color units (range: 16.9 – 33.8)	Lightly tea colored
Alkalinity (ppm)	< 0.0 acidified	0.1 – 2.0 extremely vulnerable	2.1 – 10 moderately vulnerable	10.1 – 25.0 low vulnerability	> 25.0 not vulnerable	**8.0** ppm (range: 7.4 – 8.3)	Moderately vulnerable
pH (std units)	< 5.5 suboptimal for successful growth and reproduction		6.5 – 9.0 optimal range for fish growth and reproduction			**6.6** ppm (range: 6.2 – 7.7)	Optimal range for fish growth and reproduction
Specific Conductivity (*u*S/cm)	< 50 *u*S/cm Characteristic of minimally impacted NH lakes		50-100 *u*S/cm Lakes with some human influence	> 100 *u*S/cm Characteristic of lakes experiencing human disturbances		**58.2** *u*S/cm (range: 55.9 – 59.8)	Characteristic of lakes with some human influence

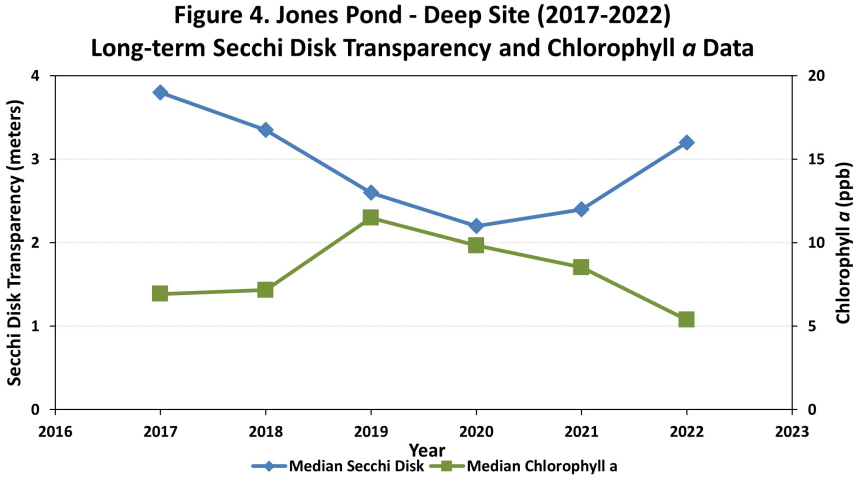
Strategies to stabilize and improve water quality

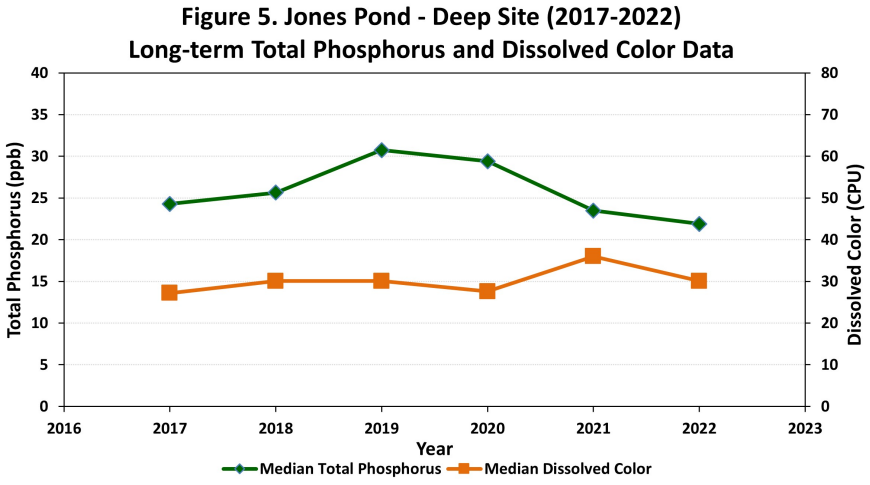
Review the "Merrymeeting Lake & River Watershed Management Plan" that provides background information and offers potential solutions to existing water quality problems. Homeowners within the Merrymeeting River watershed may want to consider implementing measures that minimize the adverse impacts of polluted runoff and erosion into Jones Pond. Refer to "Landscaping at the Water's Edge: An Ecological Approach" and "New Hampshire Homeowner's Guide to Stormwater Management: Do-It-Yourself Stormwater Solutions for Your Home" for more information on how to reduce nutrient loading caused by overland run-off. NH Lakes also provides a series of resources aimed at educating residents and protecting our lakes and ponds.

- https://www.alton.nh.gov/forms/conservation/MM_FINAL_WMP_092019.pdf
- https://extension.unh.edu/resources/files/Resource004159_Rep5940.pdf
- https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/homeowner-guide-stormwater.pdf
- https://nhlakes.org/lakesmart-resource-library/









Figures 2 and 3. Seasonal comparison of Jones Pond water transparency (Secchi Disk depth), chlorophyll *a* and dissolved color for 2022. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll *a* and/or color concentrations.

Figures 4 and 5. Annual median Jones Pond water transparency, chlorophyll *a*, dissolved color and total phosphorus concentrations measured between 2017 and 2022, through the New Hampshire Lakes Lay Monitoring Program**.** The long-term data provide insight into the water quality fluctuations, among years, that have been documented in Jones Pond.

Figure 6. Jones Pond - Site Deep

Temperature Profiles (May 16 through September 28, 2022)

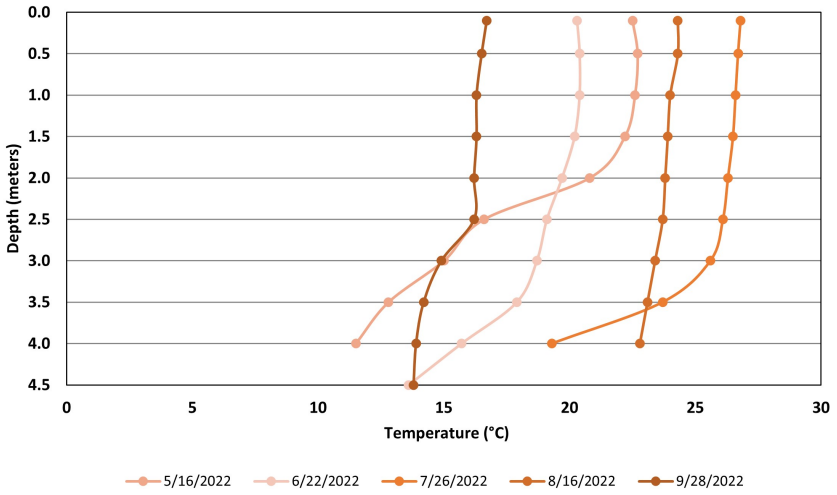


Figure 7. Jones Pond - Site Deep

Dissolved Oxygen Profiles (May 16 through September 28, 2022)

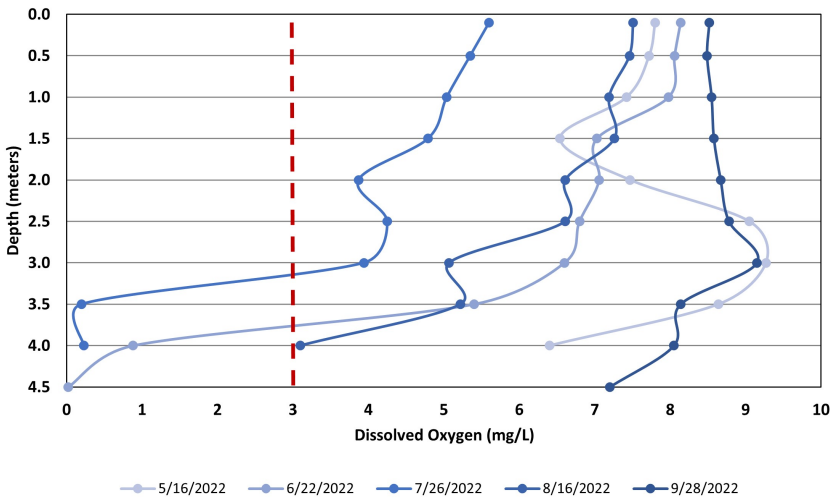


Figure 8. Jones Pond - Site Deep

Specific Conductivity (May 16 through September 28, 2022)

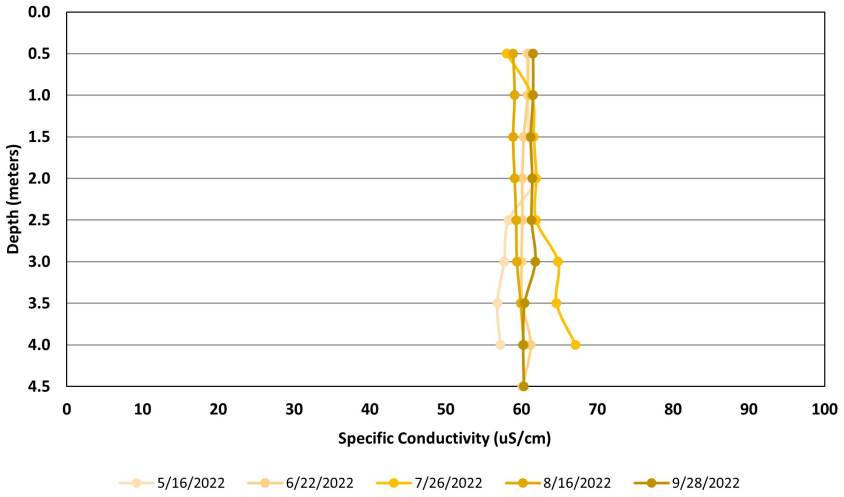
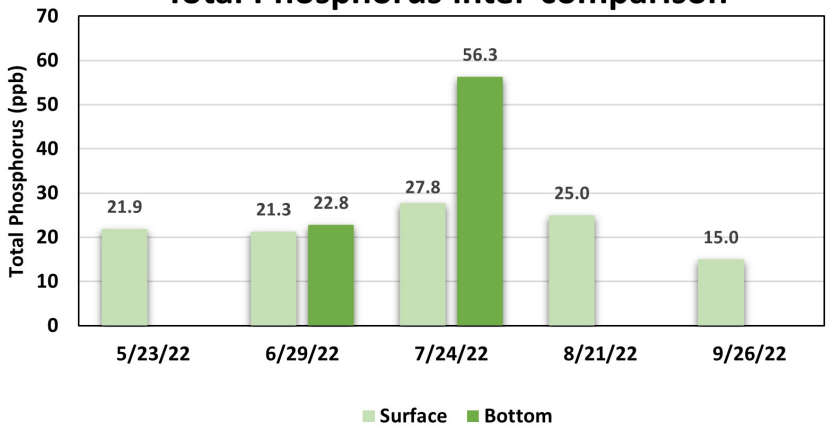


Figure 9. Jones Pond - Site Deep
Total Phosphorus inter-comparison



Figures 6, 7 and 8. Temperature, dissolved oxygen and specific conductivity profiles displaying the water quality differences in 0.5-meter increments. Notice the decreasing dissolved oxygen concentrations, near the lake bottom, through the season. The dashed vertical red line in Figure 7 displays the dissolved oxygen threshold for the successful growth and reproduction of warm water fish such as bass and perch.

Figure 9. Total phosphorus comparison between the surface (epilimnion) and bottom water (hypolimnion) zones. Notice the differences in the bottom water total phosphorus concentrations, relative to surface water concentrations.

Table 3. Merrymeeting River Watershed Lakes (Alton and New Durham)
(2022 water quality data collected between May 23 and October 19)

Lake	Average (range) Secchi Disk Transparency (meters)	Average (range) Chlorophyll-*a* (ppb)	Average (range) Total Phosphorus (ppb)	Average (range) Dissolved Oxygen (ppm)
Merrymeeting Lake	10.6 meters (range: 9.6 – 12.9)	0.7 ppb (range: 0.4 – 1.3)	5.0 ppb (range: 2.8 – 11.7)	10.0 ppm (range: 5.8 – 12.5)
Marsh Pond	2.9 meters (range: 2.2 – 3.7)	21.9 ppb (range: 5.2 – 86.2)	34.4 ppb (range: 18.1 – 85.0)	2.0 ppm (range: 0.1 – 6.5)
Jones Pond	3.2 meters (range: 2.2 – 3.8)	7.3 ppb (range: 4.9 – 11.0)	22.2 ppb (range: 15.0 – 27.8)	1.5 ppm (range: 0.2 – 3.9)
Downing Pond	2.7 meters (range: 2.6 – 2.8)	5.6 ppb (range: 4.4 – 7.1)	23.0 ppb (range: 16.8 – 27.9)	------
Wentworth Pond	3.3 meters (single value)	6.1 ppb (single value)	18.1 ppb (single value)	0.9 ppm (range: 0.2 – 1.6)

- Water quality data are reported for a deep reference sampling location in each water body
- Dissolved oxygen measurements were taken late season and from the bottom water layer (metalimnion or hypolimnion)
- ------ indicates the site is too shallow to form a bottom water laver

Data Interpretation: Overview of factors to consider when reviewing the Jones Pond data

This highlight report provides a general overview of the current and historical conditions of Jones Pond. The report is intended to provide a simple assessment of the water quality trends. Should you have additional questions about interpreting your water quality results, we would be happy to discuss the data with you and/or any concerns you may have. In general, some factors that influence the current and long-term water quality results/trends for our New Hampshire lakes and ponds include:

- **Land-use Patterns** within the watershed (drainage basin) – Research indicates land use patterns have an impact on how much phosphorus (nutrient) is washing into our lakes. In general, more urbanized watersheds have a greater degree of phosphorus runoff than highly forested/vegetated drainage areas.
- **Weather Patterns** – Rainfall and temperature can influence water quality. Wet periods, and overland runoff, tend to be a time when elevated nutrients and other pollutants are transported into our lakes. Temperature can also influence water quality conditions since many aquatic plants and algae tend to respond to changing seasonal conditions. Unusually warm periods are sometimes tied to short-term algal and cyanobacteria blooms.
- **Best Management Practices (BMPs)** – The presence/absence of best management practices can have an interplay on water quality. BMPs are measures that are used to manage nutrients and other pollutants that could otherwise make their way into our lakes. Properties that employ BMPs, designed specifically to remove pollutants of concern (e.g. sediments and phosphorus), are less likely to contribute nutrients and other pollutants into our lakes.
- **Temperature (Thermal) Stratification** – Many lakes become thermally stratified during the summer months and may form three distinct thermal layers: upper water layer (epilimnion), middle lake layer (metalimnion) and bottom cold-water layer (hypolimnion). These thermal zones form a barrier to lake mixing, during the summer months, and can coincide with differences in dissolved oxygen and specific conductivity through the water column (Figures 6, 7 and 8).
- **Internal Nutrient Loading** (nutrients that are introduced from the sediments along the lake bottom) – Some of our lakes experience significant internal nutrient loading. Such lakes generally tend to be well stratified and exhibit increasing deep water phosphorus concentrations, relative to surface levels, from May through September/October (Figure 9). Lakes that exhibit internal nutrient loading may also exhibit increasing deep water specific conductivity concentrations (a measure of dissolved materials) through the summer months.

Figure 10. Jones Pond

New Durham, NH
2022 Deep water sampling site

Aerial Orthophoto Source: NH GRANIT
GPS Coordinates collected by the UNH Center for Freshwater Biology

NH Extension