CHALK POND

2024 SAMPLING HIGHLIGHTS

Station Deep

New Durham, NH

Blue = Oligotrophic

Light Green = Mesotrophic

Dark Green = Eutrophic

Gray = No Data

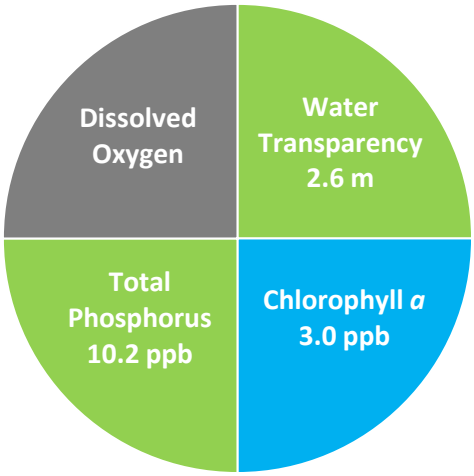


Figure 1. Chalk Pond Water Quality (2024)

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 29 and September 23, 2024.

Table 1. 2024 Chalk Pond Seasonal Averages and NH DES Aquatic Life Nutrient Criteria[1]

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Chalk Pond Average (range)	Chalk Pond Classification
Water Clarity (meters)	> 4.0 – 7.0	2.5 - 4.0	< 2.5	**2.6** meters (2.1 – 3.0)	Mesotrophic
Chlorophyll *a* [1] (ppb)	< 3.3	3.3 – 5.0	> 5.0 – 11.0	**3.0** ppb (2.1 – 5.2)	Oligotrophic
Total Phosphorus [1] (ppb)	< 8.0	8.0 – 12.0	> 12.0 – 28.0	**10.2** ppb (9.2 – 12.1)	Mesotrophic
Dissolved Oxygen (ppm)	> 5.0 – 7.0	2.0 – 5.0	< 2.0	Not Assessed *	Not Assessed

* Chalk Pond did not develop a mid or deep-water layer that is the basis for the dissolved oxygen classification criteria.

Table 2. 2024 Chalk Pond Seasonal Average Accessory Water Quality Measurements

Parameter	Assessment Criteria					Chalk Pond Average (range)	Chalk Pond Classification
Color (color units)	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored	**10.5** color units (range: 8.8 – 12.9)	Slightly 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	**6.2** ppm (range: 5.2 – 6.7)	Moderately vulnerable
pH (std units)	< 5.5 suboptimal for successful growth and reproduction		6.5 – 9.0 optimal range for fish growth and reproduction			**7.0** standard units (range: 6.9 – 7.1)	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		**43.7** *u*S/cm (range: 42.5 – 46.3)	Characteristic of minimally impacted NH lakes

Strategies to stabilize and improve water quality

Implement Best Management Practices (BMPs) within the Chalk Pond watershed to minimize the adverse impacts of polluted runoff and erosion into Chalk 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 through the LakeSmart program.

Figure 2. Chalk Pond (2024 Seasonal Data)
Secchi Disk Transparency and Chlorophyll *a* Data

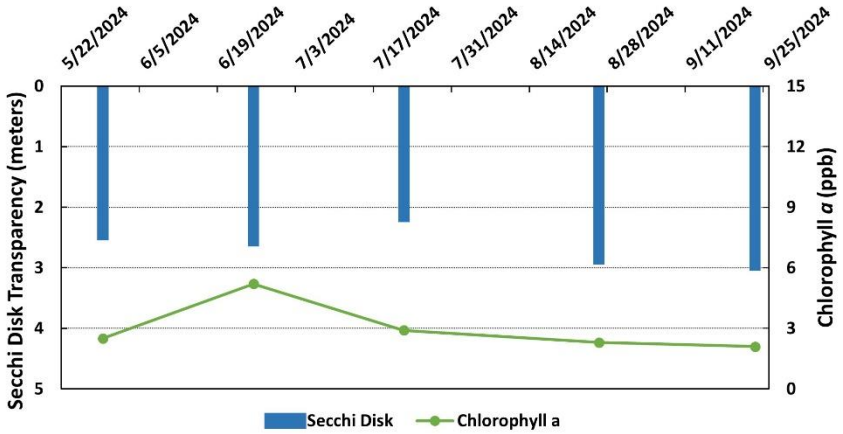


Figure 3. Chalk Pond (2024 Seasonal Data)
Secchi Disk Transparency and Dissolved Color Data

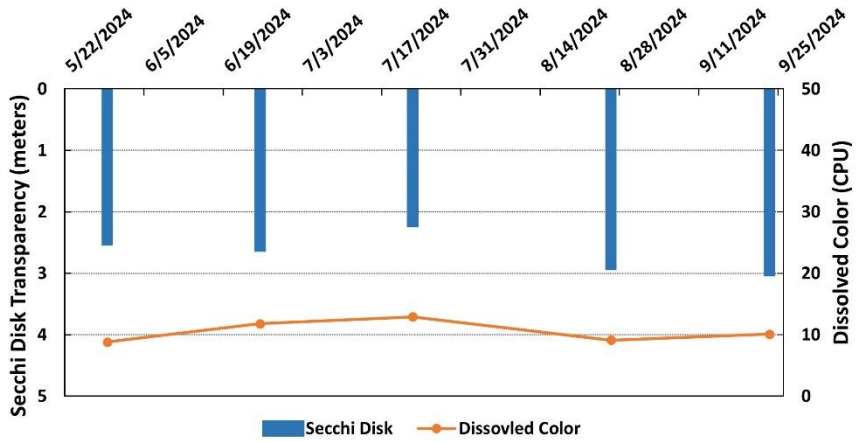


Figure 4. Chalk Pond - Deep Site (1982-2024)
Long-term Secchi Disk Transparency and Chlorophyll *a* Data

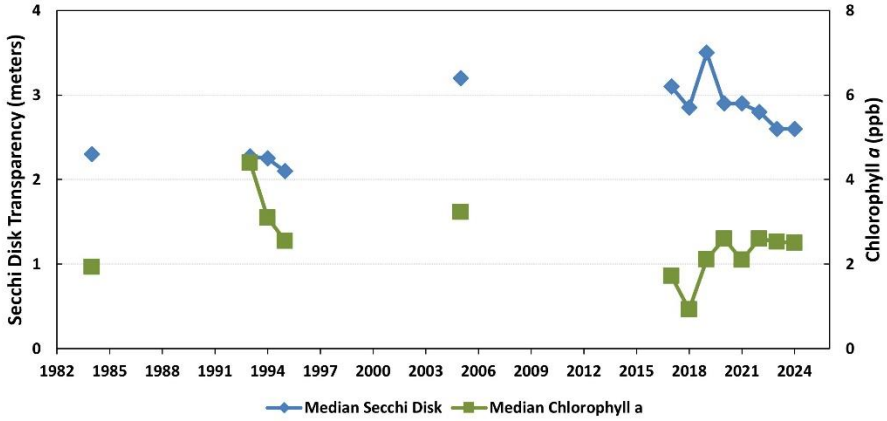
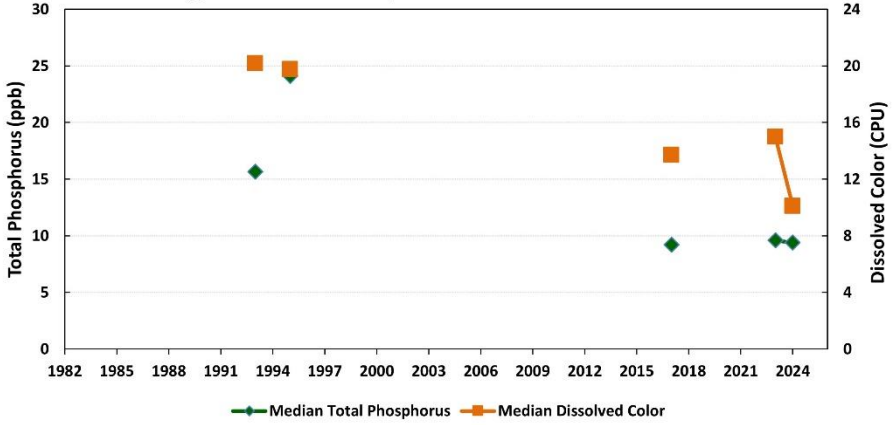


Figure 5. Chalk Pond - Deep Site (1982-2024)
Long-term Total Phosphorus and Dissolved Color Data



Figures 2 and 3. Seasonal comparison of Chalk Pond water transparency (Secchi Disk depth), chlorophyll *a,* and dissolved color for 2024. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll *a* and/or color concentrations.

Figures 4 and 5. Annual median Chalk Pond water transparency, chlorophyll *a*, dissolved color, and total phosphorus concentrations measured between 1984 and 2024, through the New Hampshire Lakes Lay Monitoring Program and the New Hampshire Department of Environmental Services**.** The long-term data provide insight into the water quality fluctuations, among years, that have been documented in Chalk Pond.

Figure 6. Chalk Pond - Site Deep
Temperature Profiles (May 29 - September 23, 2024)

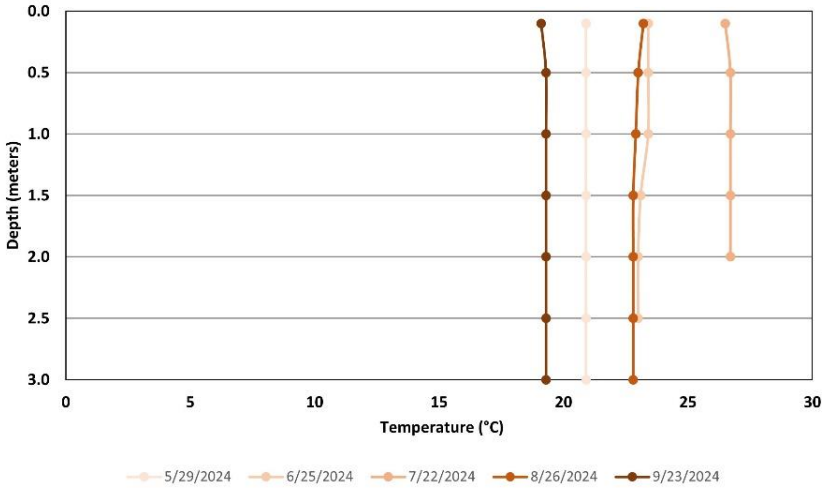


Figure 7. Chalk Pond - Site Deep
Dissolved Oxygen Profiles (May 29 - September 23, 2024)

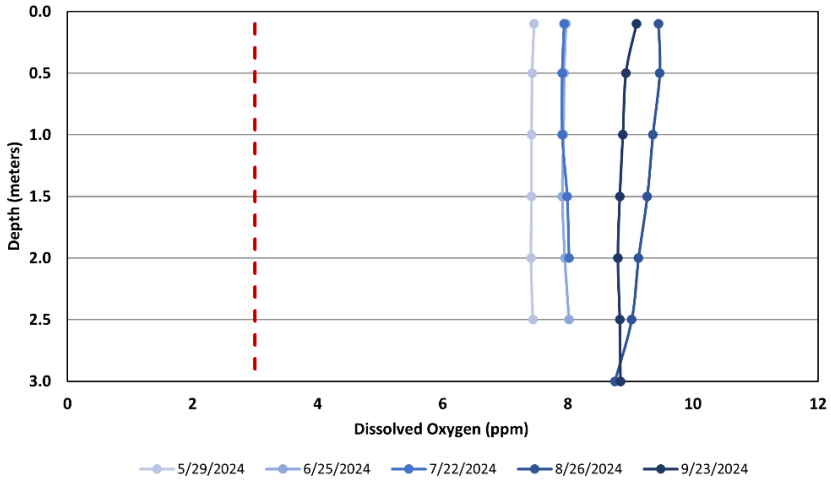


Figure 8. Chalk Pond - Site Deep
Conductivity Profiles (May 29- September 23, 2024)

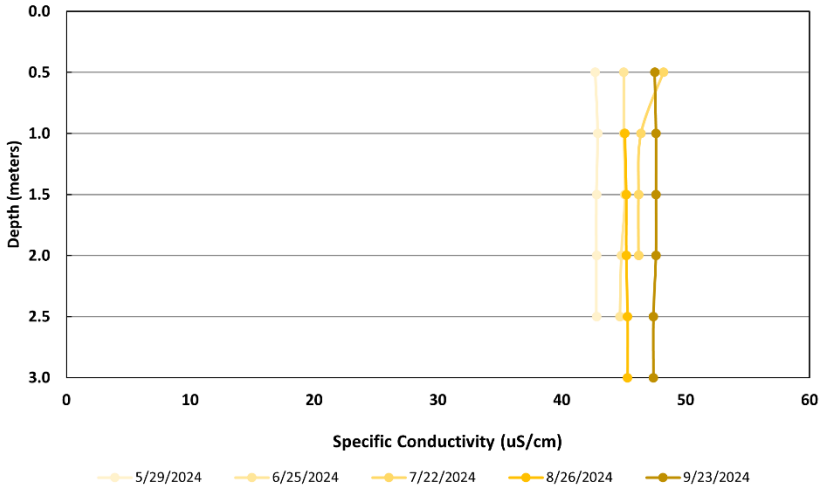
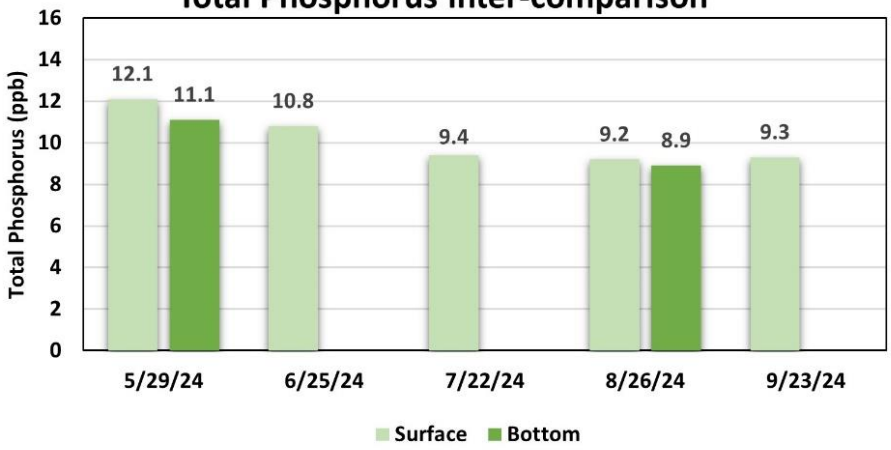


Figure 9. Chalk Pond - Site Deep
Total Phosphorus inter-comparison



Figures 6, 7, and 8. Temperature, dissolved oxygen, and specific conductivity profiles display the water quality differences in 0.5-meter increments. 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 zones.

Table 3. New Durham Lake/Pond Inter-comparison
(2024 water quality data collected between May 20 and October 31)

Lake	Average (range) Secchi Disk Transparency (meters)	Average (range) Chlorophyll-*a* (ppb)	Average (range) Total Phosphorus (ppb)	Average (range) Dissolved Oxygen (ppm)
Chalk Pond	2.6 meters (range: 2.1 – 3.0)	3.0 ppb (range: 2.1 – 5.2)	10.2 ppb (range: 9.2 – 12.1)	------
Downing Pond	2.6 meters (range: 2.1 – 3.0)	6.9 ppb (range: 3.9 – 10.2)	23.9 ppb (range: 20.5 – 26.4)	------
Jones Pond	2.6 meters (range: 2.1 – 3.3)	7.5 ppb (range: 4.2 – 10.2)	23.6 ppb (range: 18.8 – 29.0)	------
Marchs Pond	3.8 meters (range: 2.1 – 6.3)	4.8 ppb (range: 3.3 – 9.0)	10.5 ppb (range: 6.7 – 15.2)	------
Marsh Pond	2.6 meters (range: 2.0 – 3.4)	7.1 ppb (range: 3.9 – 11.6)	25.2 ppb (range: 17.4 – 32.2)	0.5 ppm (range: 0.3 – 0.7)
Merrymeeting Lake	9.3 meters (range: 7.0 – 10.5)	1.1 ppb (range: 0.4 – 1.7)	4.7 ppb (range: 3.1 – 8.6)	9.7 ppm (range: 6.7 – 12.3)
Shaws Pond	4.0 meters (range: 3.4 – 4.5)	3.3 ppb (range: 2.1 – 5.2)	8.9 ppb (range: 7.8 – 9.9)	2.3 ppm (range: 0.2 – 6.4)

- 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
- ------ indicates the site is too shallow to form a bottom water layer

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

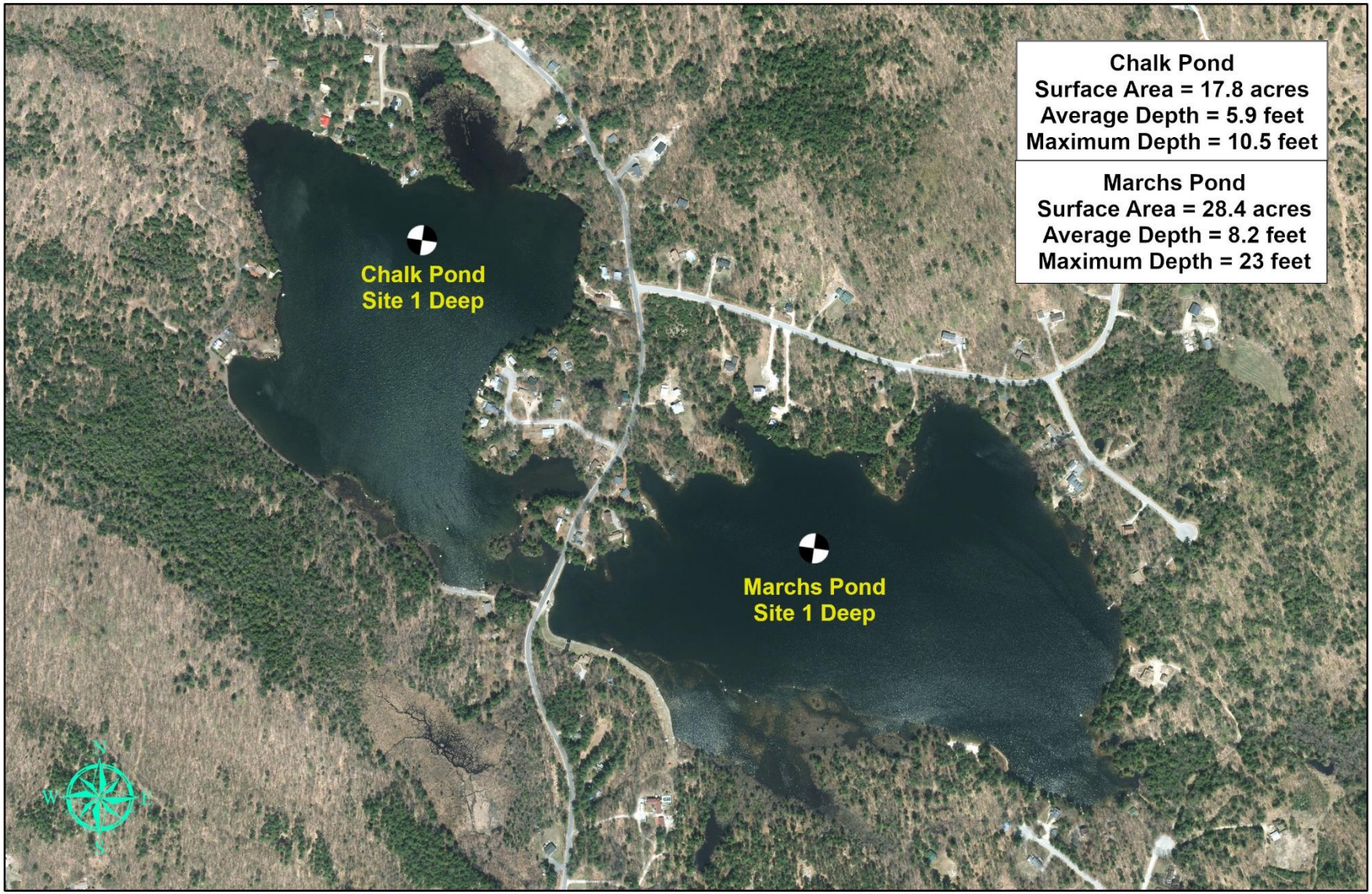
This highlight report provides a general overview of the current and historical conditions of Chalk Pond. The report is intended to provide a simple assessment of the water quality trends. Should you have additional questions about interpreting your water quality results, we would be happy to discuss 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.
- **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, during the summer months.

Figure 10. Chalk Pond and Marchs Pond

New Durham, NH

2024 Deep water sampling sites



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

DOWNING POND

2024 SAMPLING HIGHLIGHTS

Station Deep

New Durham, NH

Extension

Blue = Oligotrophic

Light Green = Mesotrophic

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Gray = No Data

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 29 and September 17, 2024.

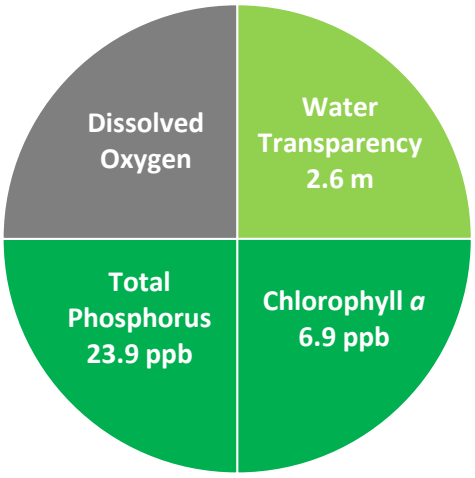


Figure 1. Downing Pond Water Quality (2024)

Table 1. 2024 Downing Pond Seasonal Averages and NH DES Aquatic Life Nutrient Criteria[1]

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Downing Pond Average (range)	Downing Pond Classification
Water Clarity (meters)	> 4.0 – 7.0	2.5 - 4.0	< 2.5	**2.6** meters (2.1 – 3.0)	Mesotrophic
Chlorophyll *a* [1] (ppb)	< 3.3	3.3 – 5.0	> 5.0 – 11.0	**6.9** ppb (3.9 – 10.2)	Eutrophic
Total Phosphorus [1] (ppb)	< 8.0	8.0 – 12.0	> 12.0 – 28.0	**23.9** ppb (20.5 – 26.4)	Eutrophic
Dissolved Oxygen (ppm)	> 5.0 – 7.0	2.0 – 5.0	< 2.0	Not Assessed *	Not Assessed

* Downing Pond did not develop a stable mid or deep-water layer that is the basis for the dissolved oxygen classification criteria.

Table 2. 2024 Downing Pond Seasonal Average Accessory Water Quality Measurements

Parameter	Assessment Criteria					Downing Pond Average (range)	Downing Pond Classification
Color (color units)	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored	**30.8** color units (range: 22.5 – 41.1)	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	**7.8** ppm (range: 7.0 – 8.4)	Moderately vulnerable
pH (std units)	< 5.5 suboptimal for successful growth and reproduction		6.5 – 9.0 optimal range for fish growth and reproduction			**6.8** standard units (range: 6.7 – 6.9)	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		**55.9** *u*S/cm (range: 54.1 – 58.6)	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 Downing 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 runoff. NH Lakes also provides a series of resources aimed at educating residents and protecting our lakes and ponds through the LakeSmart program.

Figure 2. Downing Pond (2024 Seasonal Data)
Secchi Disk Transparency and Chlorophyll *a* Data

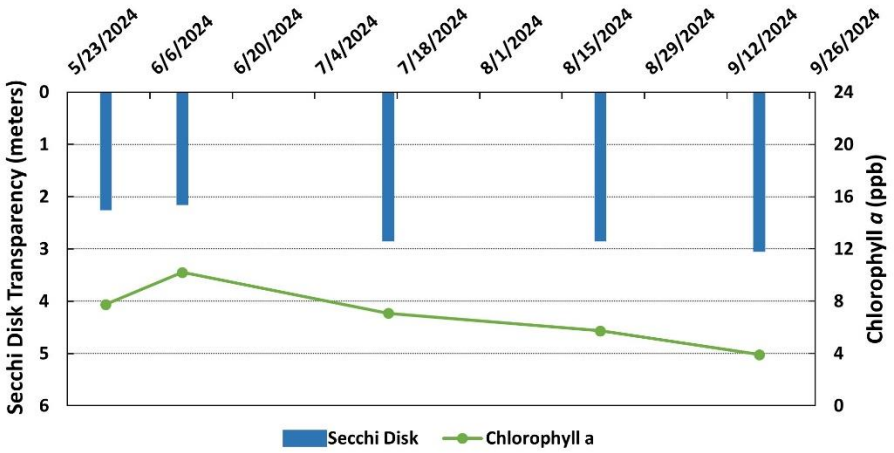


Figure 3. Downing Pond (2024 Seasonal Data)
Secchi Disk Transparency and Dissolved Color Data

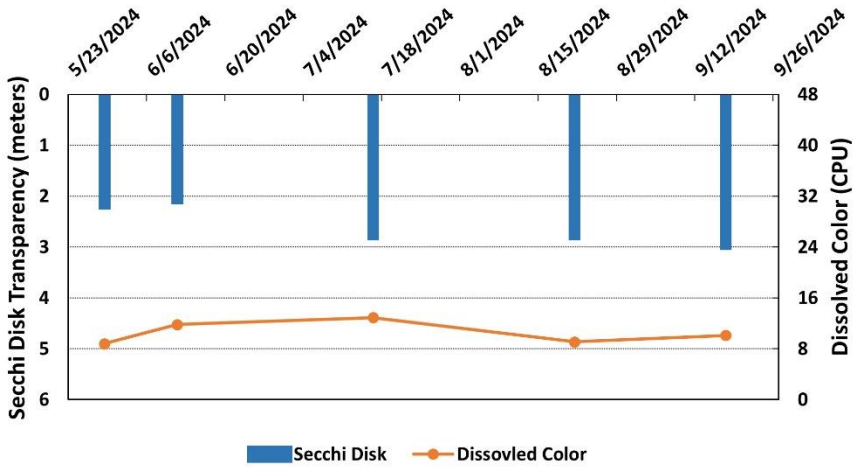


Figure 4. Downing Pond - Deep Site (2017-2024)
Long-term Secchi Disk Transparency and Chlorophyll *a* Data

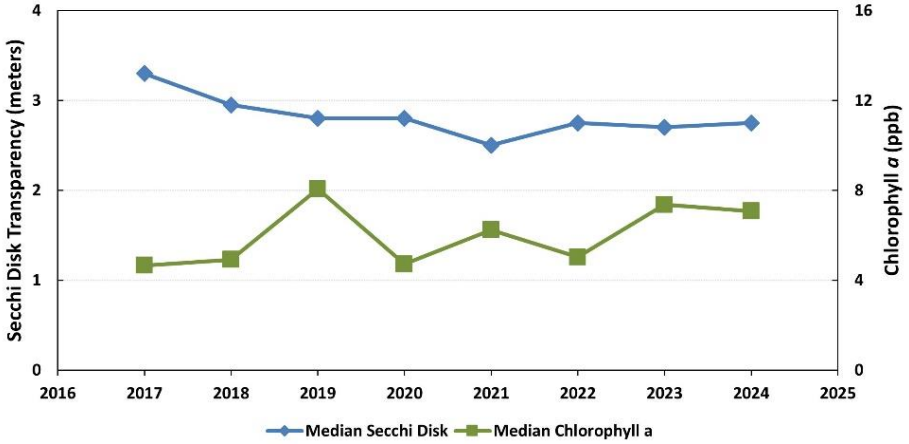
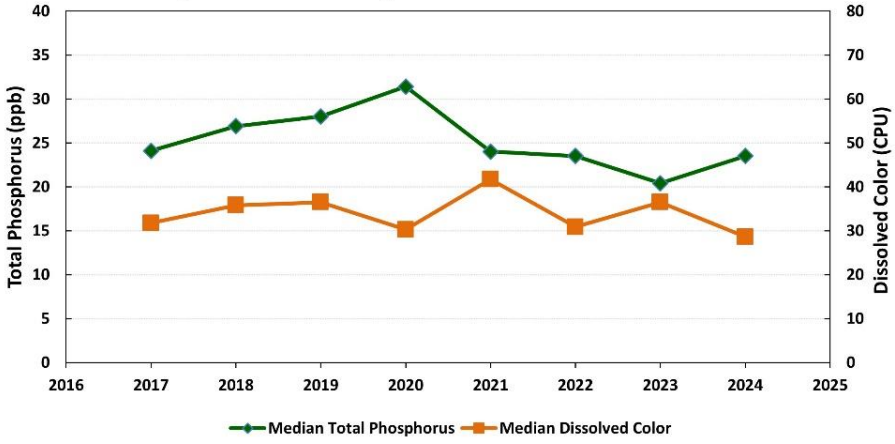


Figure 5. Downing Pond - Deep Site (2017-2024)
Long-term Total Phosphorus and Dissolved Color Data



Figures 2 and 3. Seasonal comparison of Downing Pond water transparency (Secchi Disk depth), chlorophyll *a,* and dissolved color for 2024. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll *a* and/or color concentrations.

Figures 4 and 5. Annual median Downing Pond water transparency, chlorophyll *a*, dissolved color, and total phosphorus concentrations measured between 2017 and 2024, 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 Downing Pond.

Figure 6. Downing Pond - Site Deep

Temperature Profiles (May 29 - September 17, 2024)

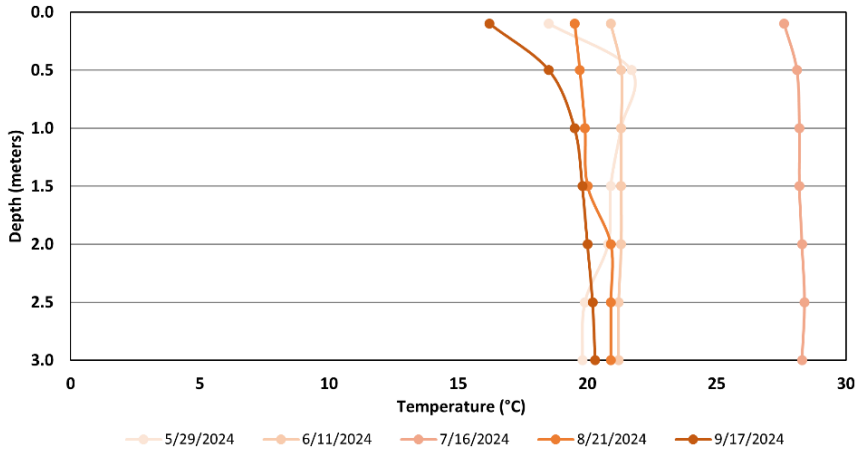


Figure 7. Downing Pond - Site Deep

Dissolved Oxygen Profiles (May 29 - September 17, 2024)

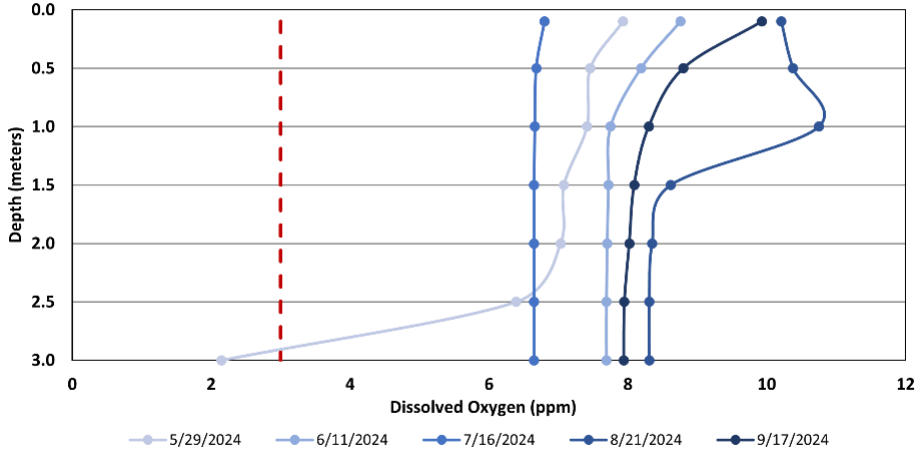


Figure 8. Downing Pond - Site Deep

Conductivity Profiles (May 29 - September 17, 2024)

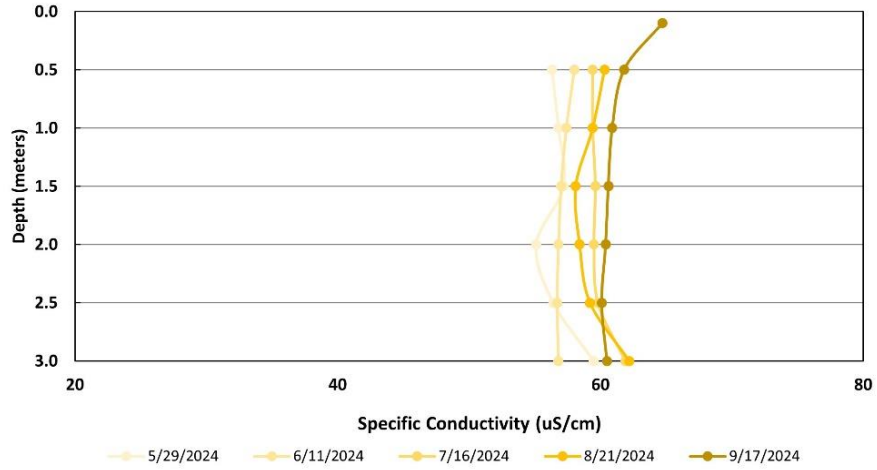
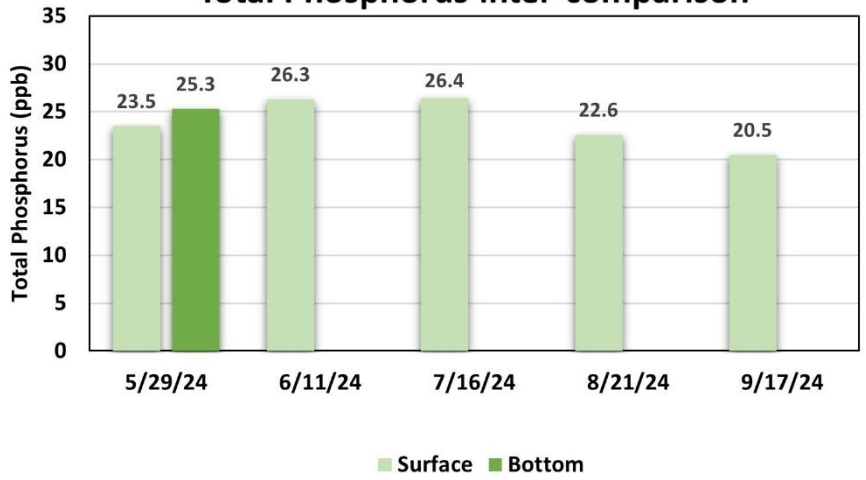


Figure 9. Downing Pond - Site Deep

Total Phosphorus inter-comparison



Figures 6, 7, and 8. Temperature, dissolved oxygen, and specific conductivity profiles display 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 zones.

Table 3. Merrymeeting River Watershed Lakes (New Durham)
(2024 water quality data collected between May 20 and October 1)

Lake	Average (range) Secchi Disk Transparency (meters)	Average (range) Chlorophyll-*a* (ppb)	Average (range) Total Phosphorus (ppb)	Average (range) Dissolved Oxygen (ppm)
Merrymeeting Lake	9.3 meters (range: 7.0 – 10.5)	1.1 ppb (range: 0.4 – 1.7)	4.7 ppb (range: 3.1 – 8.6)	10.0 ppm (range: 6.7 – 12.6)
Marsh Pond	2.6 meters (range: 2.0 – 3.4)	7.1 ppb (range: 3.9 – 11.6)	25.2 ppb (range: 17.4 – 32.2)	0.5 ppm (range: 0.3 – 0.7)
Jones Pond	2.6 meters (range: 2.1 – 3.3)	7.5 ppb (range: 4.2 – 10.2)	23.6 ppb (range: 18.8 – 29.0)	------
Downing Pond	2.6 meters (range: 2.1 – 3.0)	6.9 ppb (range: 3.9 – 10.2)	23.9 ppb (range: 20.5 – 26.4)	------

- 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 layer

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

This highlight report provides a general overview of the current and historical conditions of Downing 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, during the summer months.

Figure 10. Downing Pond

New Durham, NH

2024 Deep water sampling site

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

Extension

NEW HAMPSHIRE LAKES LAY MONITORING

JONES POND

2024 SAMPLING HIGHLIGHTS

Station Deep

New Durham, NH

Blue = Oligotrophic

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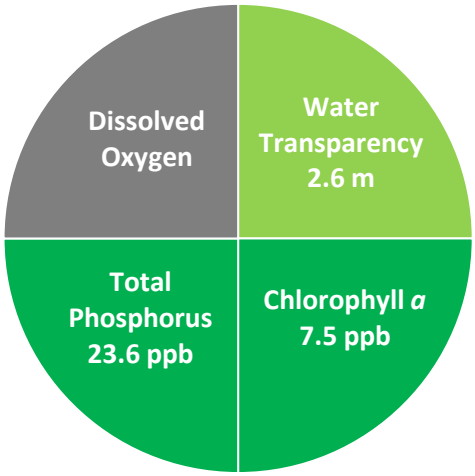


Figure 1. Jones Pond Water Quality (2024)

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 20 and September 17, 2024.

Table 1. 2024 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	**2.6** meters (2.1 – 3.3)	Mesotrophic
Chlorophyll *a* [1] (ppb)	< 3.3	3.3 – 5.0	> 5.0 – 11.0	**7.5** ppb (7.0 – 8.4)	Eutrophic
Total Phosphorus [1] (ppb)	< 8.0	8.0 – 12.0	> 12.0 – 28.0	**23.6** ppb (18.8 – 29.0)	Eutrophic
Dissolved Oxygen (ppm)	> 5.0 – 7.0	2.0 – 5.0	< 2.0	Not Assessed *	Not Assessed

* Jones Pond did not develop a mid or deep-water layer that is the basis for the dissolved oxygen classification criteria.

Table 2. 2024 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	**24.6** color units (range: 18.6 – 35.2)	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	**7.8** ppm (range: 7.0 – 8.4)	Moderately vulnerable
pH (std units)	< 5.5 suboptimal for successful growth and reproduction		6.5 – 9.0 optimal range for fish growth and reproduction			**6.8** ppm (range: 6.7 – 7.1)	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		**55.3** *u*S/cm (range: 53.6 – 56.5)	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 through the LakeSmart program.

Figure 2. Jones Pond (2024 Seasonal Data)
Secchi Disk Transparency and Chlorophyll *a* Data

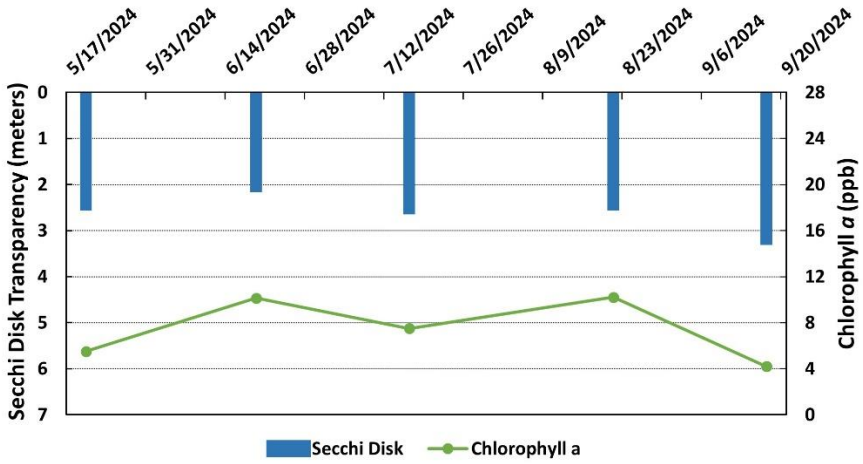


Figure 3. Jones Pond (2024 Seasonal Data)
Secchi Disk Transparency and Dissolved Color Data

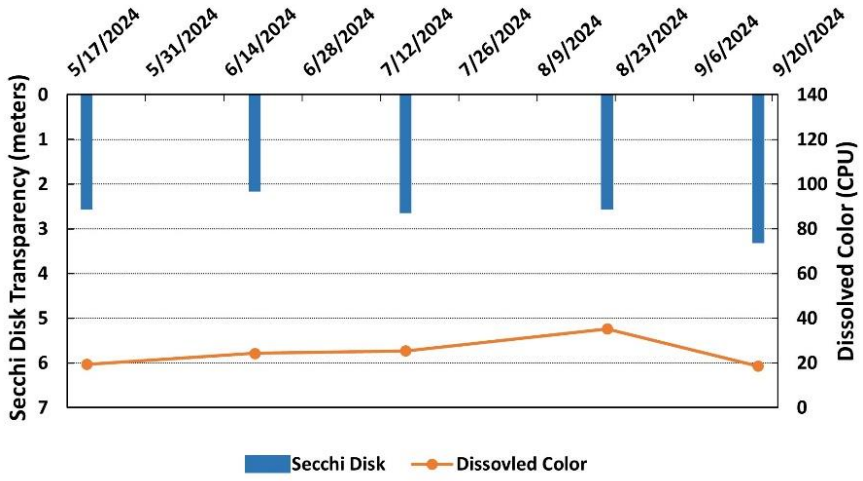


Figure 4. Jones Pond - Deep Site (2017-2024)
Long-term Secchi Disk Transparency and Chlorophyll *a* Data

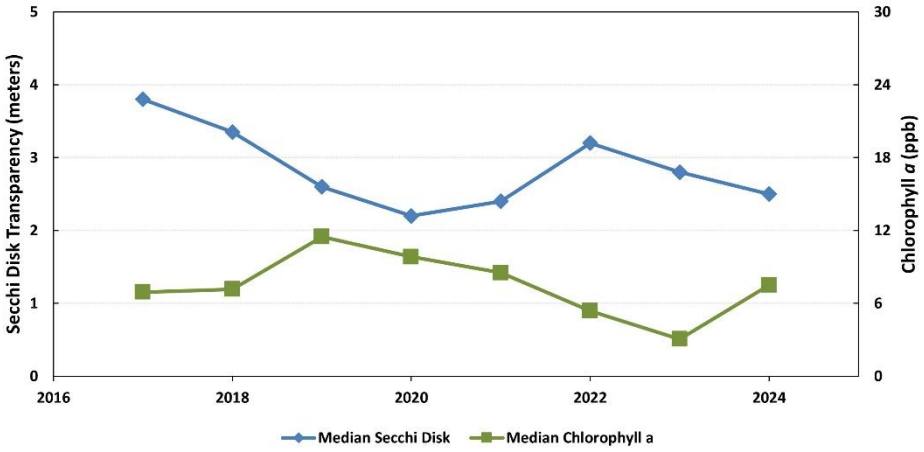
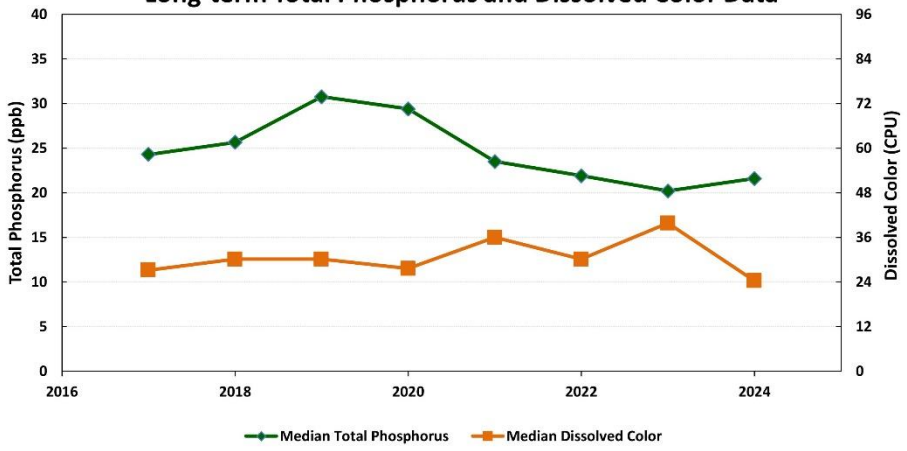


Figure 5. Jones Pond - Deep Site (2017-2024)
Long-term Total Phosphorus and Dissolved Color Data



Figures 2 and 3. Seasonal comparison of Jones Pond water transparency (Secchi Disk depth), chlorophyll *a,* and dissolved color for 2024. 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 2024, 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 20 - September 17, 2024)

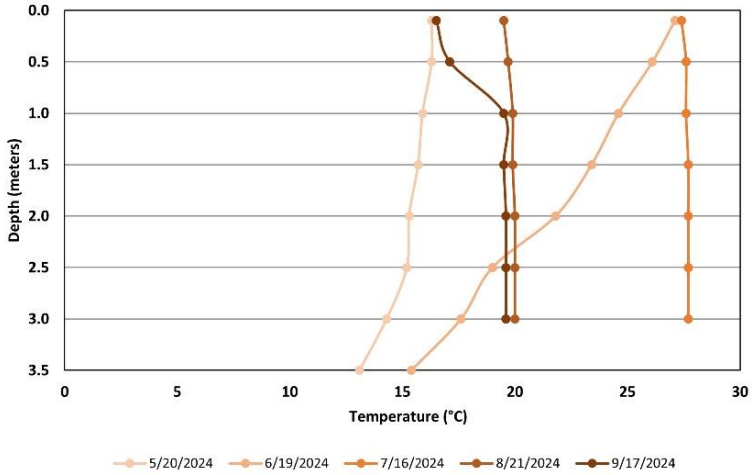


Figure 7. Jones Pond - Site Deep
Dissolved Oxygen Profiles (May 20 - September 17, 2024)

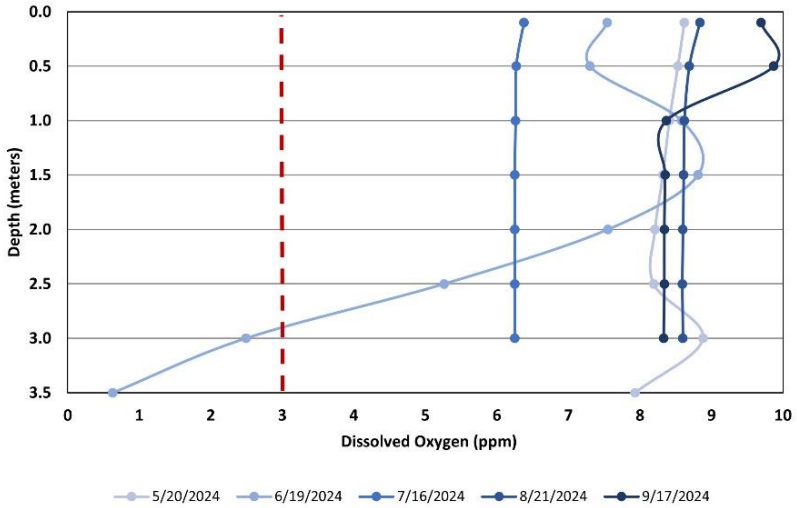


Figure 8. Jones Pond - Site Deep
Specific Conductivity (May 20 - September 17, 2024)

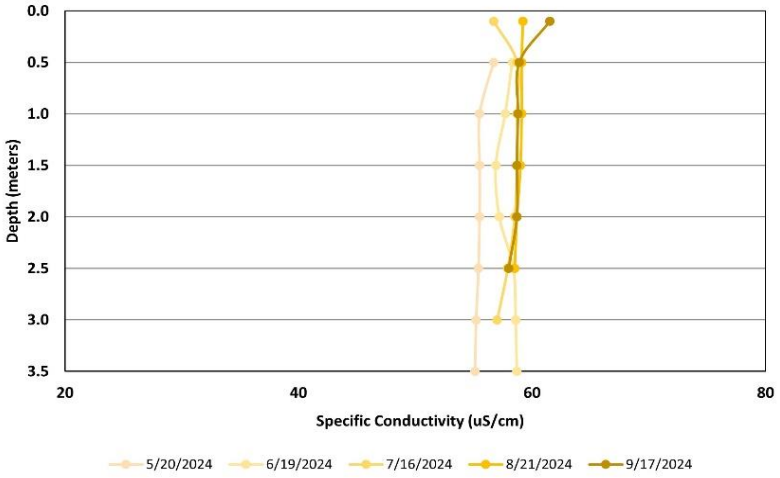
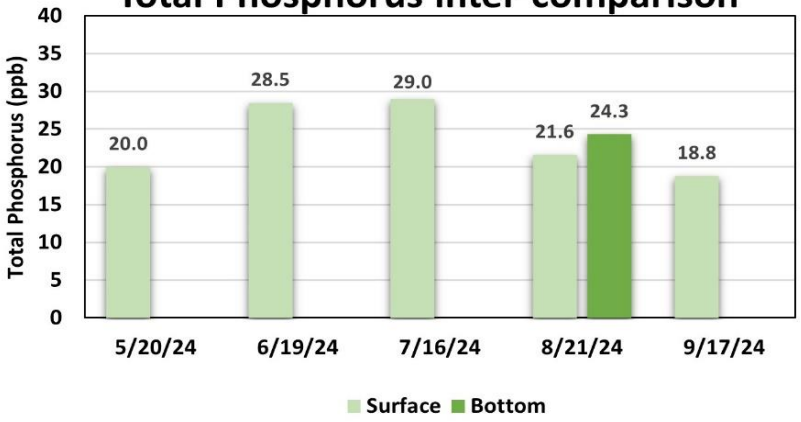


Figure 9. Jones Pond - Site Deep
Total Phosphorus inter-comparison



Figures 6, 7, and 8. Temperature, dissolved oxygen, and specific conductivity profiles display 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.

Table 3. Merrymeeting River Watershed Lakes (New Durham)
(2024 water quality data collected between May 20 and October 1)

Lake	Average (range) Secchi Disk Transparency (meters)	Average (range) Chlorophyll-*a* (ppb)	Average (range) Total Phosphorus (ppb)	Average (range) Dissolved Oxygen (ppm)
Merrymeeting Lake	9.3 meters (range: 7.0 – 10.5)	1.1 ppb (range: 0.4 – 1.7)	4.7 ppb (range: 3.1 – 8.6)	10.0 ppm (range: 6.7 – 12.6)
Marsh Pond	2.6 meters (range: 2.0 – 3.4)	7.1 ppb (range: 3.9 – 11.6)	25.2 ppb (range: 17.4 – 32.2)	0.5 ppm (range: 0.3 – 0.7)
Jones Pond	2.6 meters (range: 2.1 – 3.3)	7.5 ppb (range: 4.2 – 10.2)	23.6 ppb (range: 18.8 – 29.0)	------
Downing Pond	2.6 meters (range: 2.1 – 3.0)	6.9 ppb (range: 3.9 – 10.2)	23.9 ppb (range: 20.5 – 26.4)	------

- 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 layer

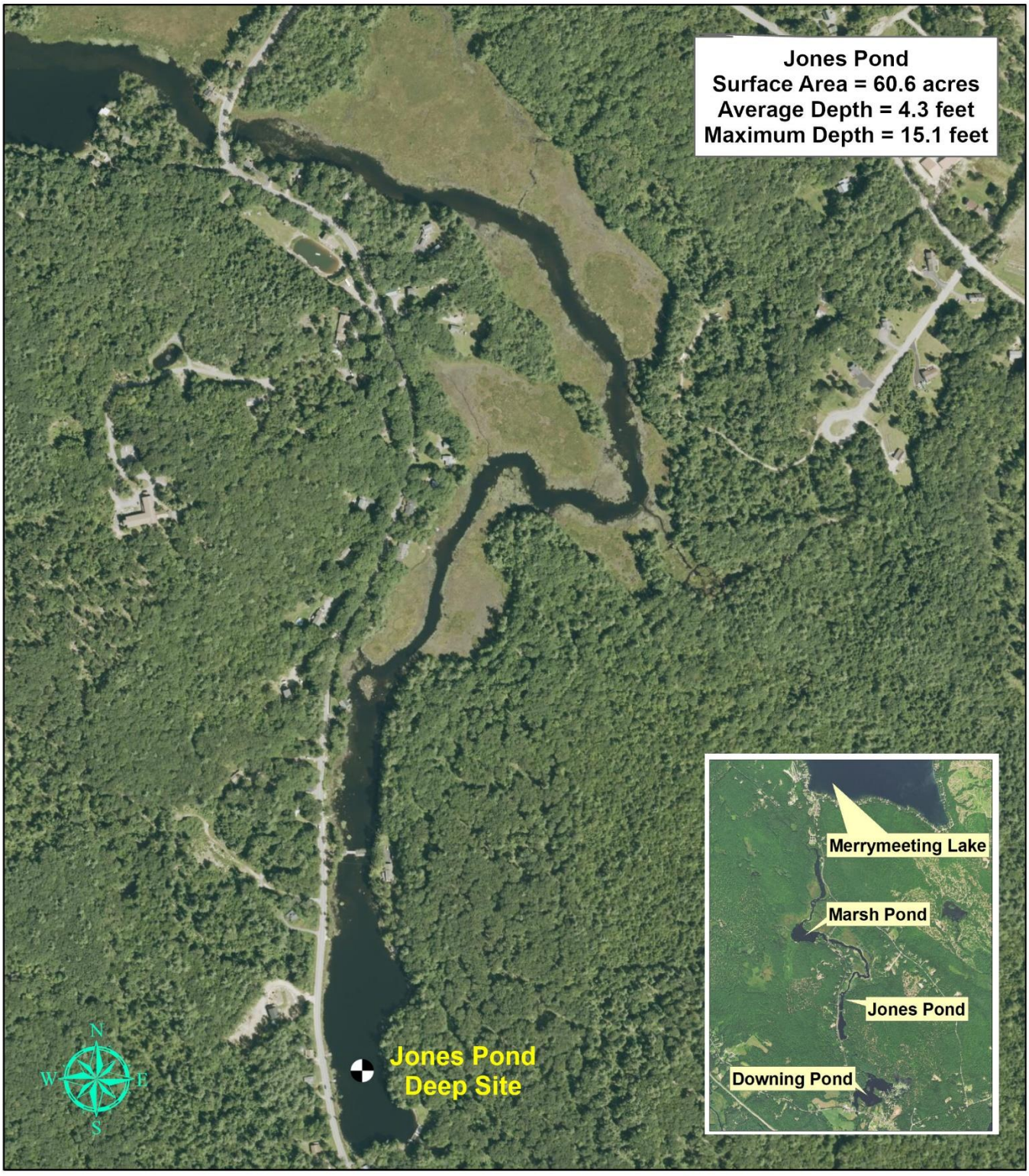
Data Interpretation: Overview of factors to consider when reviewing the Jones Pond data

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
2024 Deep water sampling site



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

Extension

NEW HAMPSHIRE LAKES LAY MONITORING

MARCHS POND

2024 SAMPLING HIGHLIGHTS

Station Deep

New Durham, NH

Blue = Oligotrophic

Light Green = Mesotrophic

Dark Green = Eutrophic

Gray = No Data

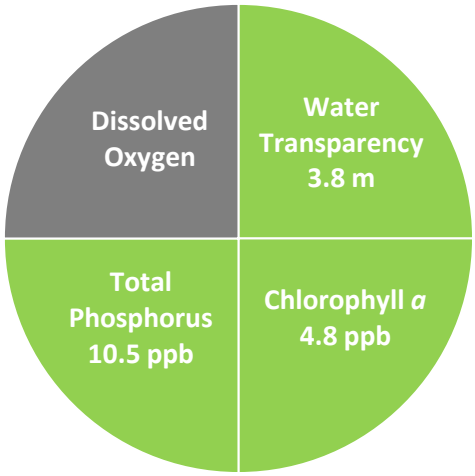


Figure 1. Marchs Pond Water Quality (2024)

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 29 and September 23, 2024.

Table 1. 2024 Marchs Pond Seasonal Averages and NH DES Aquatic Life Nutrient Criteria[1]

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Marchs Pond Average (range)	Marchs Pond Classification
Water Clarity (meters)	> 4.0 – 7.0	2.5 - 4.0	< 2.5	**3.8** meters (2.1 – 6.3)	Mesotrophic
Chlorophyll *a* [1] (ppb)	< 3.3	3.3 – 5.0	> 5.0 – 11.0	**4.8** ppb (3.3 – 9.0)	Mesotrophic
Total Phosphorus [1] (ppb)	< 8.0	8.0 – 12.0	> 12.0 – 28.0	**10.5** ppb (6.7 – 15.2)	Mesotrophic
Dissolved Oxygen (ppm)	> 5.0 – 7.0	2.0 – 5.0	< 2.0	Not Assessed *	Not Assessed

* Marchs Pond did not develop a mid or deep-water layer that is the basis for the dissolved oxygen classification criteria.

Table 2. 2024 Marchs Pond Seasonal Average Accessory Water Quality Measurements

Parameter	Assessment Criteria					Marchs Pond Average (range)	Marchs Pond Classification
Color (color units)	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored	**12.0** color units (range: 8.2 – 19.4)	Slightly 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	**4.6** ppm (range: 2.9 – 5.6)	Moderately vulnerable
pH (std units)	< 5.5 suboptimal for successful growth and reproduction		6.5 – 9.0 optimal range for fish growth and reproduction			**7.0** standard units (range: 6.8 – 7.5)	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		**58.0** *u*S/cm (range: 52.2 – 62.1)	Characteristic of lakes with some human influence

Strategies to stabilize and improve water quality

Implement Best Management Practices (BMPs) within the Marchs Pond watershed to minimize the adverse impacts of polluted runoff and erosion into Marchs 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 through the LakeSmart program.

Figure 2. Marchs Pond (2024 Seasonal Data)
Secchi Disk Transparency and Chlorophyll *a* Data

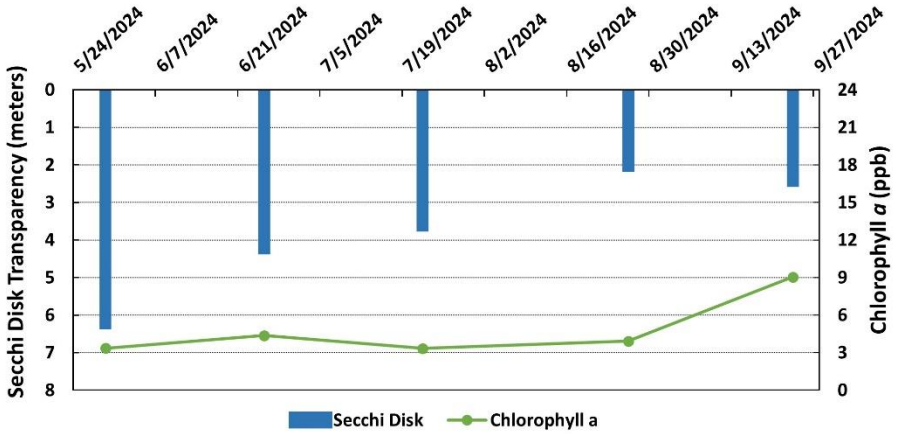


Figure 3. Marchs Pond (2024 Seasonal Data)
Secchi Disk Transparency and Dissolved Color Data

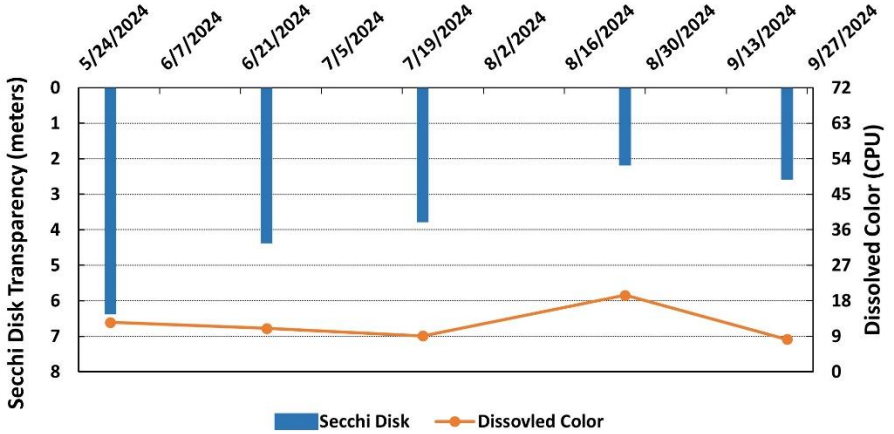


Figure 4. Marchs Pond - Deep Site (1984-2024)
Long-term Secchi Disk Transparency and Chlorophyll *a* Data

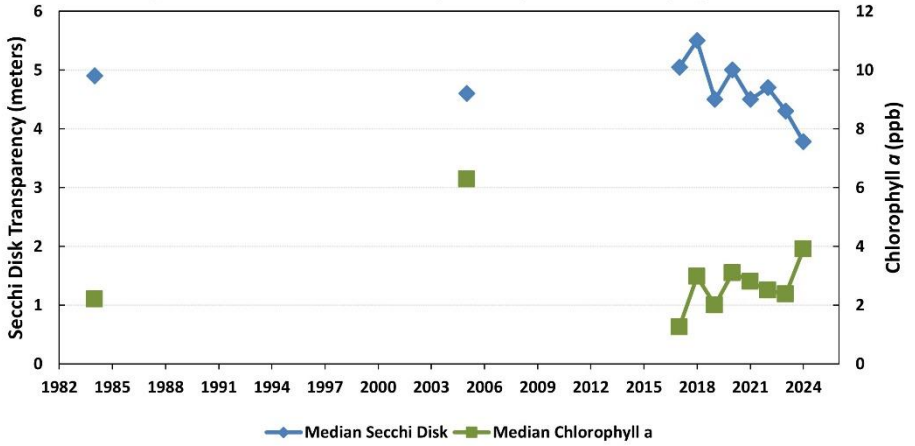
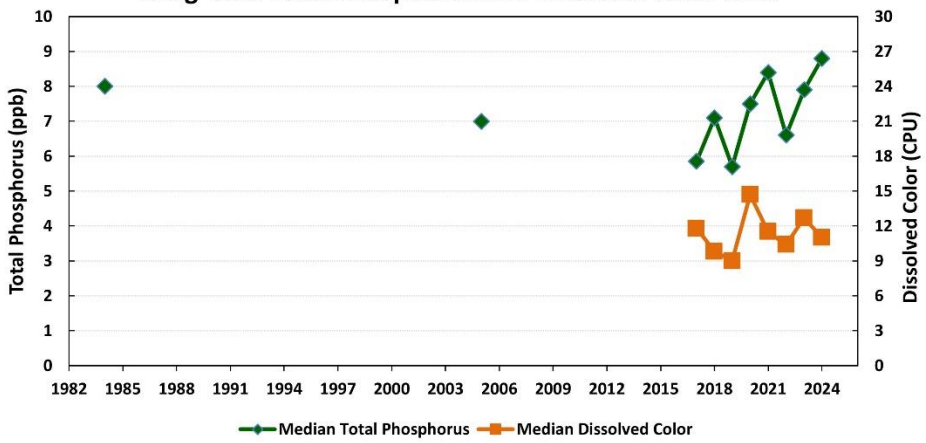
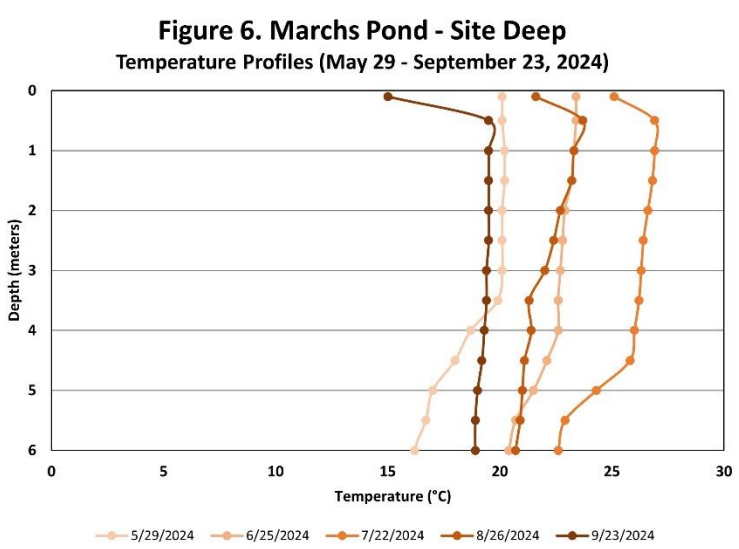


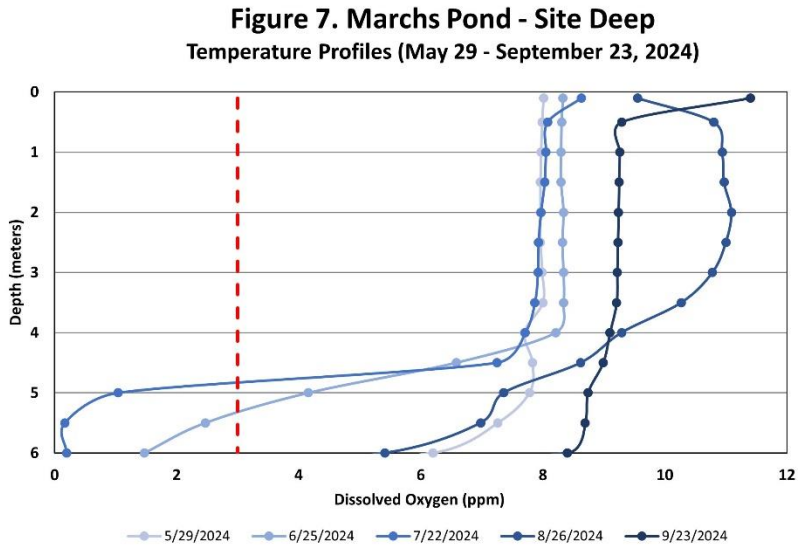
Figure 5. Marchs Pond - Deep Site (1984-2024)
Long-term Total Phosphorus and Dissolved Color Data

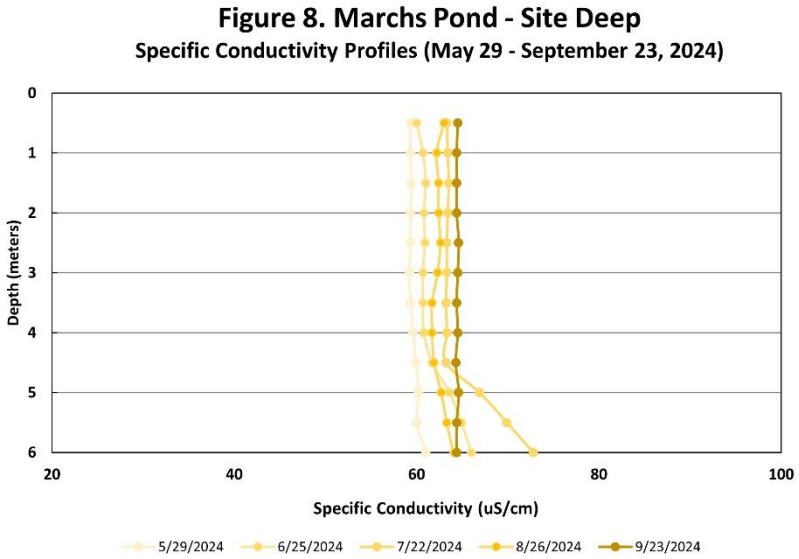


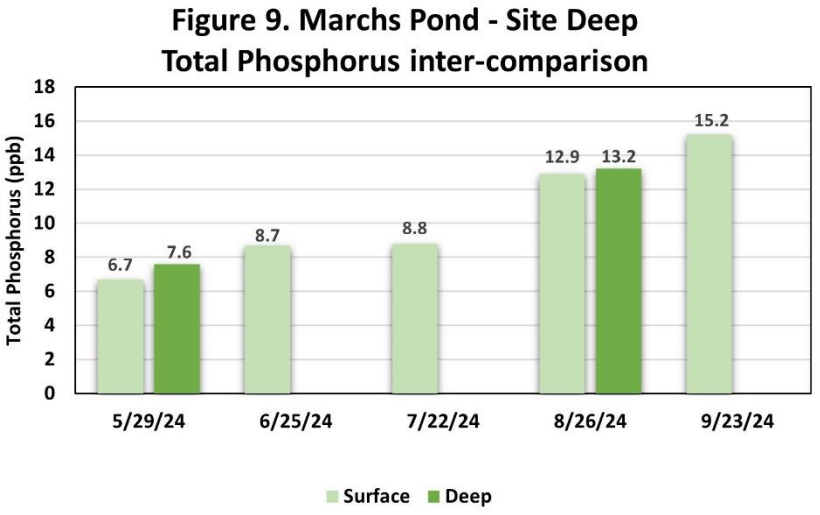
Figures 2 and 3. Seasonal comparison of Marchs Pond water transparency (Secchi Disk depth), chlorophyll *a,* and dissolved color for 2024. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll *a* and/or color concentrations.

Figures 4 and 5. Annual median Marchs Pond water transparency, chlorophyll *a*, dissolved color, and total phosphorus concentrations measured between 1984 and 2024, through the New Hampshire Lakes Lay Monitoring Program and the New Hampshire Department of Environmental Services**.** The long-term data provide insight into the water quality fluctuations, among years, that have been documented in Marchs Pond.









Figures 6, 7, and 8. Temperature, dissolved oxygen, and specific conductivity profiles display 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 zones.

Table 3. New Durham Lake/Pond Inter-comparison
(2024 water quality data collected between May 20 and October 31)

Lake	Average (range) Secchi Disk Transparency (meters)	Average (range) Chlorophyll-*a* (ppb)	Average (range) Total Phosphorus (ppb)	Average (range) Dissolved Oxygen (ppm)
Chalk Pond	2.6 meters (range: 2.1 – 3.0)	3.0 ppb (range: 2.1 – 5.2)	10.2 ppb (range: 9.2 – 12.1)	------
Downing Pond	2.6 meters (range: 2.1 – 3.0)	6.9 ppb (range: 3.9 – 10.2)	23.9 ppb (range: 20.5 – 26.4)	------
Jones Pond	2.6 meters (range: 2.1 – 3.3)	7.5 ppb (range: 4.2 – 10.2)	23.6 ppb (range: 18.8 – 29.0)	------
Marchs Pond	3.8 meters (range: 2.1 – 6.3)	4.8 ppb (range: 3.3 – 9.0)	10.5 ppb (range: 6.7 – 15.2)	------
Marsh Pond	2.6 meters (range: 2.0 – 3.4)	7.1 ppb (range: 3.9 – 11.6)	25.2 ppb (range: 17.4 – 32.2)	0.5 ppm (range: 0.3 – 0.7)
Merrymeeting Lake	9.3 meters (range: 7.0 – 10.5)	1.1 ppb (range: 0.4 – 1.7)	4.7 ppb (range: 3.1 – 8.6)	9.7 ppm (range: 6.7 – 12.3)
Shaws Pond	4.0 meters (range: 3.4 – 4.5)	3.3 ppb (range: 2.1 – 5.2)	8.9 ppb (range: 7.8 – 9.9)	2.3 ppm (range: 0.2 – 6.4)

- 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
- ------ indicates the site is too shallow to form a bottom water layer

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

This highlight report provides a general overview of the current and historical conditions of Marchs 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:

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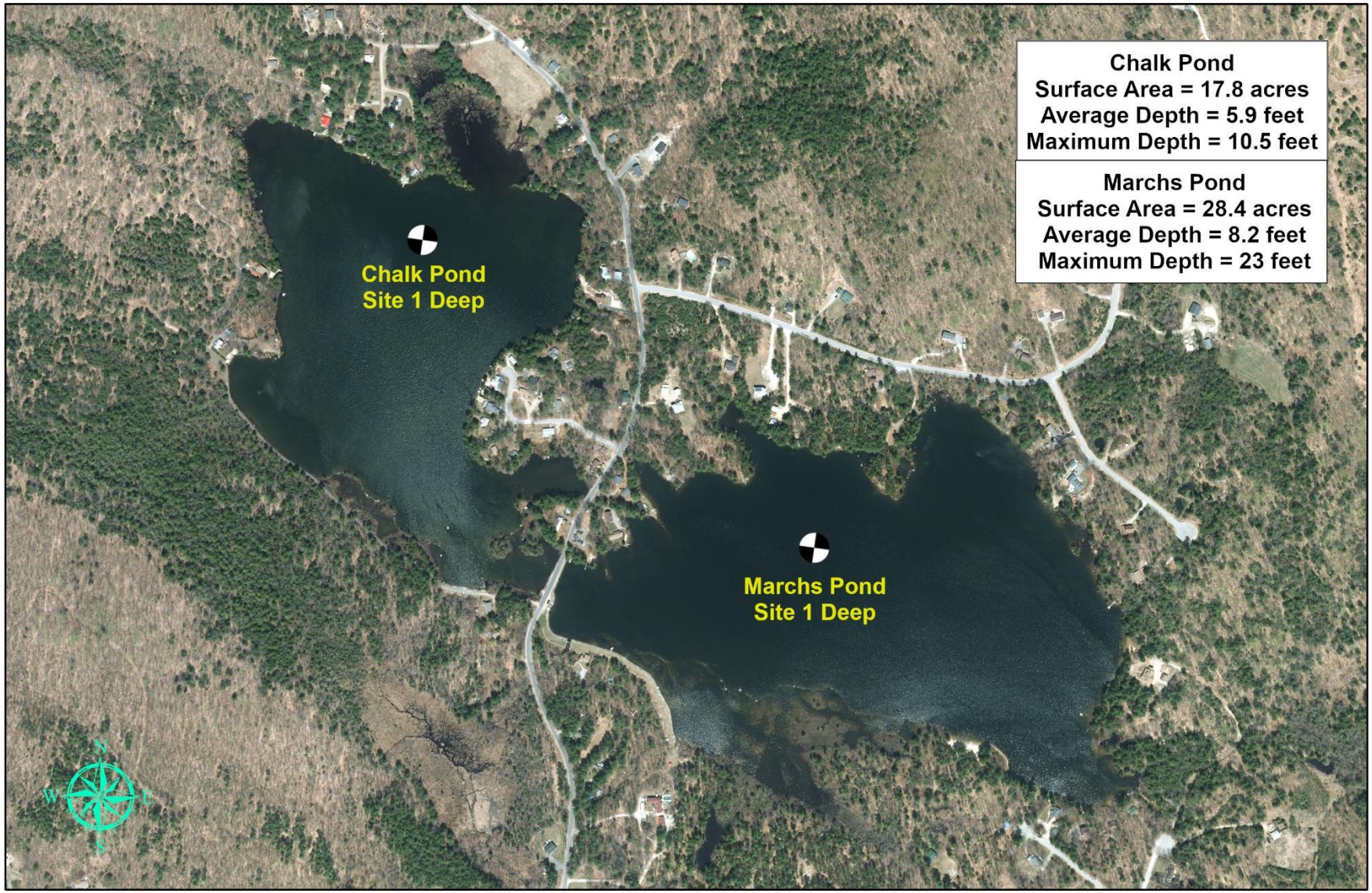
- **Best Management Practices (BMPs)** – The presence/absence of best management practices can have an interplay on water quality. BMPs are measures that are used to manage nutrients and other pollutants that could otherwise make their way into our lakes. Properties that employ BMPs, designed specifically 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, during the summer months.

Figure 10. Chalk Pond and Marchs Pond

New Durham, NH

2024 Deep water sampling sites



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

NH Extension

NEW HAMPSHIRE LAKES LAY MONITORING

MARSH POND

2024 SAMPLING HIGHLIGHTS

Station Deep

New Durham, NH

Blue = Oligotrophic

Light Green = Mesotrophic

Dark Green = Eutrophic

Gray = No Data

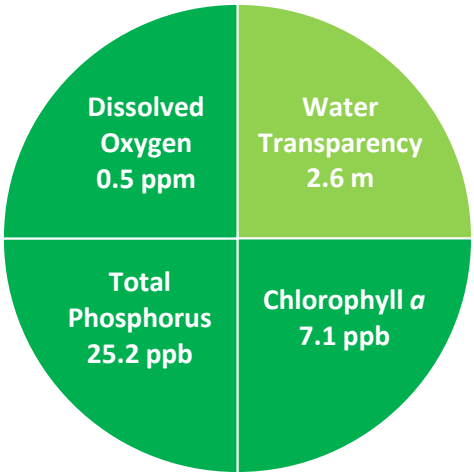


Figure 1. Marsh Pond Water Quality (2024)

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 20 and September 9, 2024.

Table 1. 2024 Marsh Pond Seasonal Averages and NH DES Aquatic Life Nutrient Criteria[1]

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Marsh Pond Average (range)	Marsh Pond Classification
Water Clarity (meters)	> 4.0 – 7.0	2.5 - 4.0	< 2.5	**2.6** meters (2.0– 3.4)	Mesotrophic
Chlorophyll *a* [1] (ppb)	< 3.3	3.3 – 5.0	> 5.0 – 11.0	**7.1** ppb (3.9 – 11.6)	Eutrophic
Total Phosphorus [1] (ppb)	< 8.0	8.0 – 12.0	> 12.0 – 28.0	**25.2** ppb (17.4 – 32.2)	Eutrophic
Dissolved Oxygen (ppm)	> 5.0 – 7.0	2.0 – 5.0	< 2.0	**0.5** ppm (0.3 – 0.7) *	Eutrophic

* Dissolved oxygen concentrations were measured between 4.0 and 4.5 meters, in the middle lake layer, on August 12, 2024.

Table 2. 2024 Marsh Pond Seasonal Average Accessory Water Quality Measurements

Parameter	Assessment Criteria					Marsh Pond Average (range)	Marsh Pond Classification
Color (color units)	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored	**22.4** color units (range: 14.8 – 42.7)	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	**7.6** ppm (range: 6.4 – 8.1)	Moderately vulnerable
pH (std units)	< 5.5 suboptimal for successful growth and reproduction		6.5 – 9.0 optimal range for fish growth and reproduction			**6.9** standard units (range: 6.7 – 7.1)	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		**52.8** *u*S/cm (range: 51.3 - 54.3)	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 Marsh 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 runoff. NH Lakes also provides a series of resources aimed at educating residents and protecting our lakes and ponds through the LakeSmart program.

Figure 2. Marsh Pond (2024 Seasonal Data)
Secchi Disk Transparency and Chlorophyll *a* Data

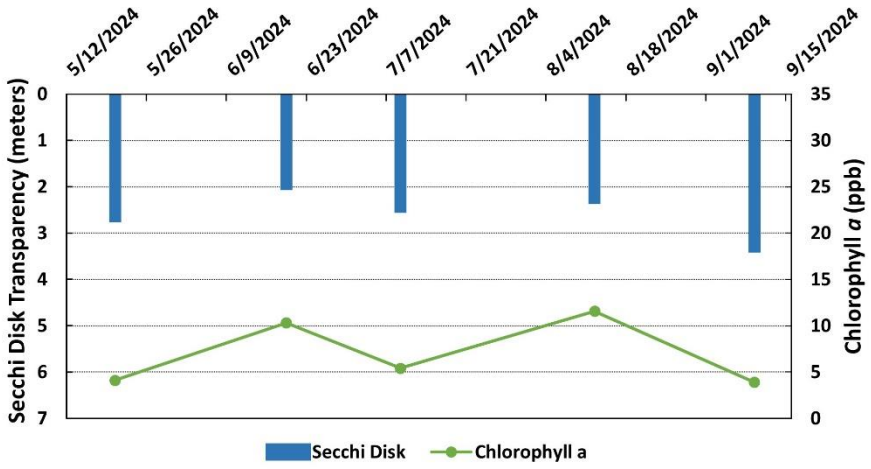


Figure 3. Marsh Pond (2024 Seasonal Data)
Secchi Disk Transparency and Dissolved Color Data

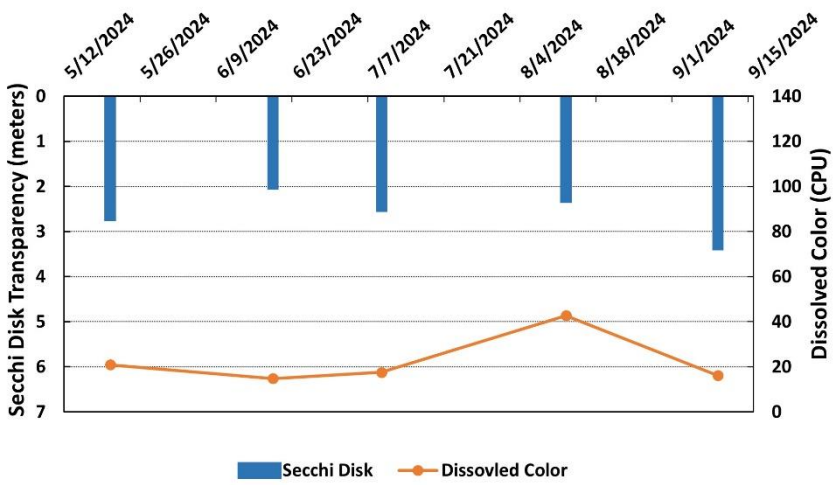


Figure 4. Marsh Pond - Deep Site (2017-2024)
Long-term Secchi Disk Transparency and Chlorophyll *a* Data

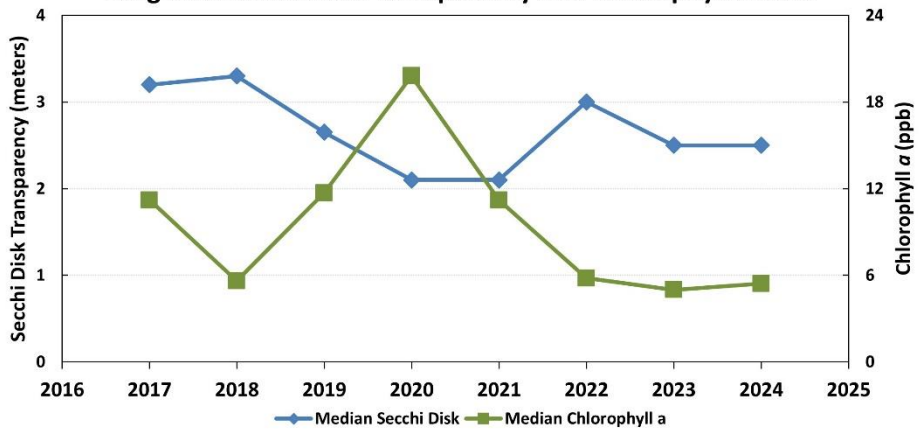
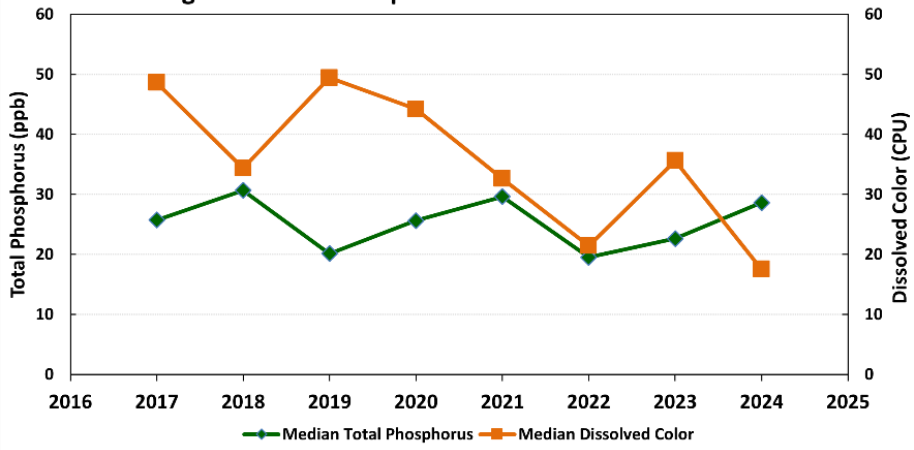


Figure 5. Marsh Pond - Deep Site (2017-2024)
Long-term Total Phosphorus and Dissolved Color Data



Figures 2 and 3. Seasonal comparison of Marsh Pond water transparency (Secchi Disk depth), chlorophyll *a,* and dissolved color for 2024. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll *a* and/or color concentrations.

Figures 4 and 5. Annual median Marsh Pond water transparency, chlorophyll *a*, dissolved color, and total phosphorus concentrations measured between 2017 and 2024, 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 Marsh Pond.

Figure 6. Marsh Pond - Site Deep

Temperature Profiles (May 20- September 9, 2024)

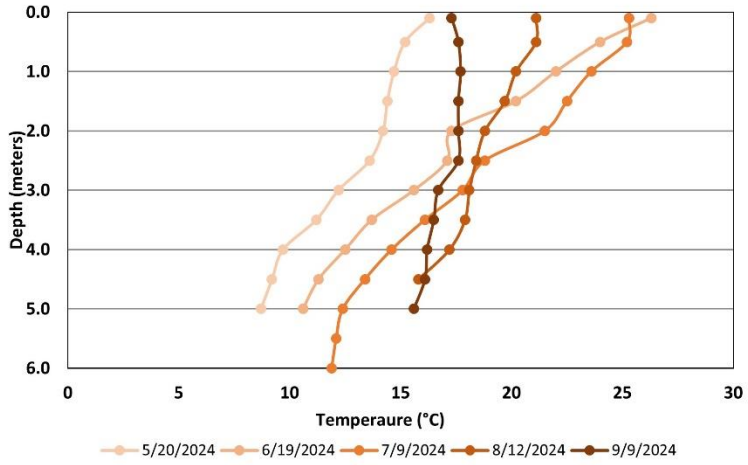


Figure 7. Marsh Pond - Site Deep

Dissolved Oxygen Profiles (May 20 - September 9, 2024)

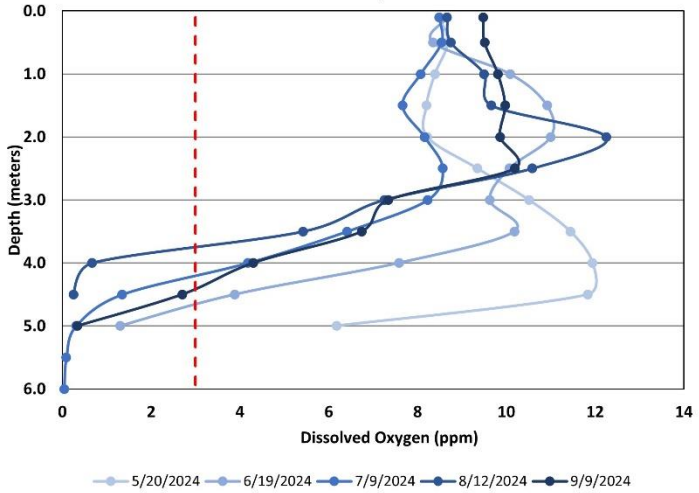


Figure 8. Marsh Pond - Site Deep

Specific Conductivity Profiles (May 20 - September 9, 2024)

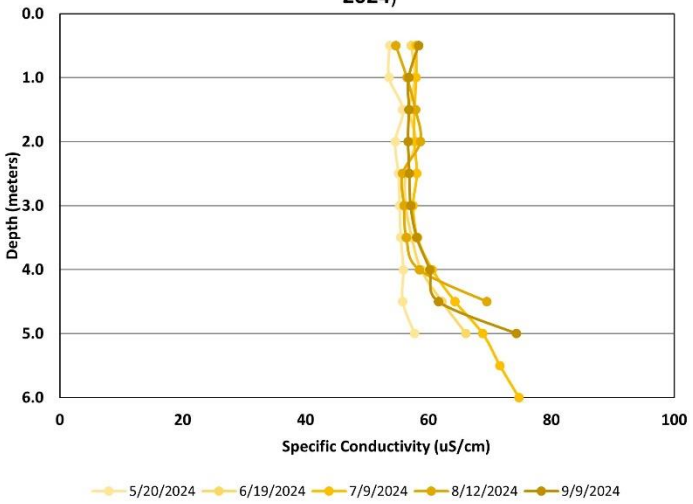
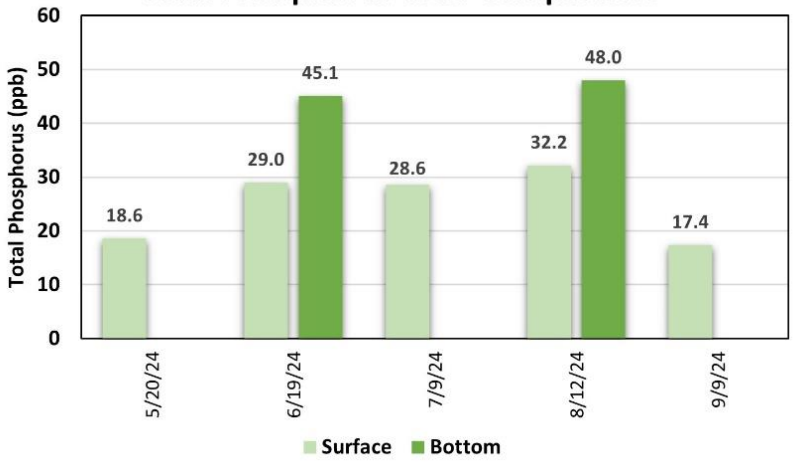


Figure 9. Marsh Pond- Site Deep

Total Phosphorus inter-comparison



Figures 6, 7, and 8. Temperature, dissolved oxygen, and specific conductivity profiles display 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, during the months of June and August.

Table 3. Merrymeeting River Watershed Lakes (Alton and New Durham)
(2024 water quality data collected between May 20 and October 1)

Lake	Average (range) Secchi Disk Transparency (meters)	Average (range) Chlorophyll-*a* (ppb)	Average (range) Total Phosphorus (ppb)	Average (range) Dissolved Oxygen (ppm)
Merrymeeting Lake	9.3 meters (range: 7.0 – 10.5)	1.1 ppb (range: 0.4 – 1.7)	4.7 ppb (range: 3.1 – 8.6)	10.0 ppm (range: 6.7 – 12.6)
Marsh Pond	2.6 meters (range: 2.0 – 3.4)	7.1 ppb (range: 3.9 – 11.6)	25.2 ppb (range: 17.4 – 32.2)	0.5 ppm (range: 0.3 – 0.7)
Jones Pond	2.6 meters (range: 2.1 – 3.3)	7.5 ppb (range: 4.2 – 10.2)	23.6 ppb (range: 18.8 – 29.0)	------
Downing Pond	2.6 meters (range: 2.1 – 3.0)	6.9 ppb (range: 3.9 – 10.2)	23.9 ppb (range: 20.5 – 26.4)	------

- 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 layer

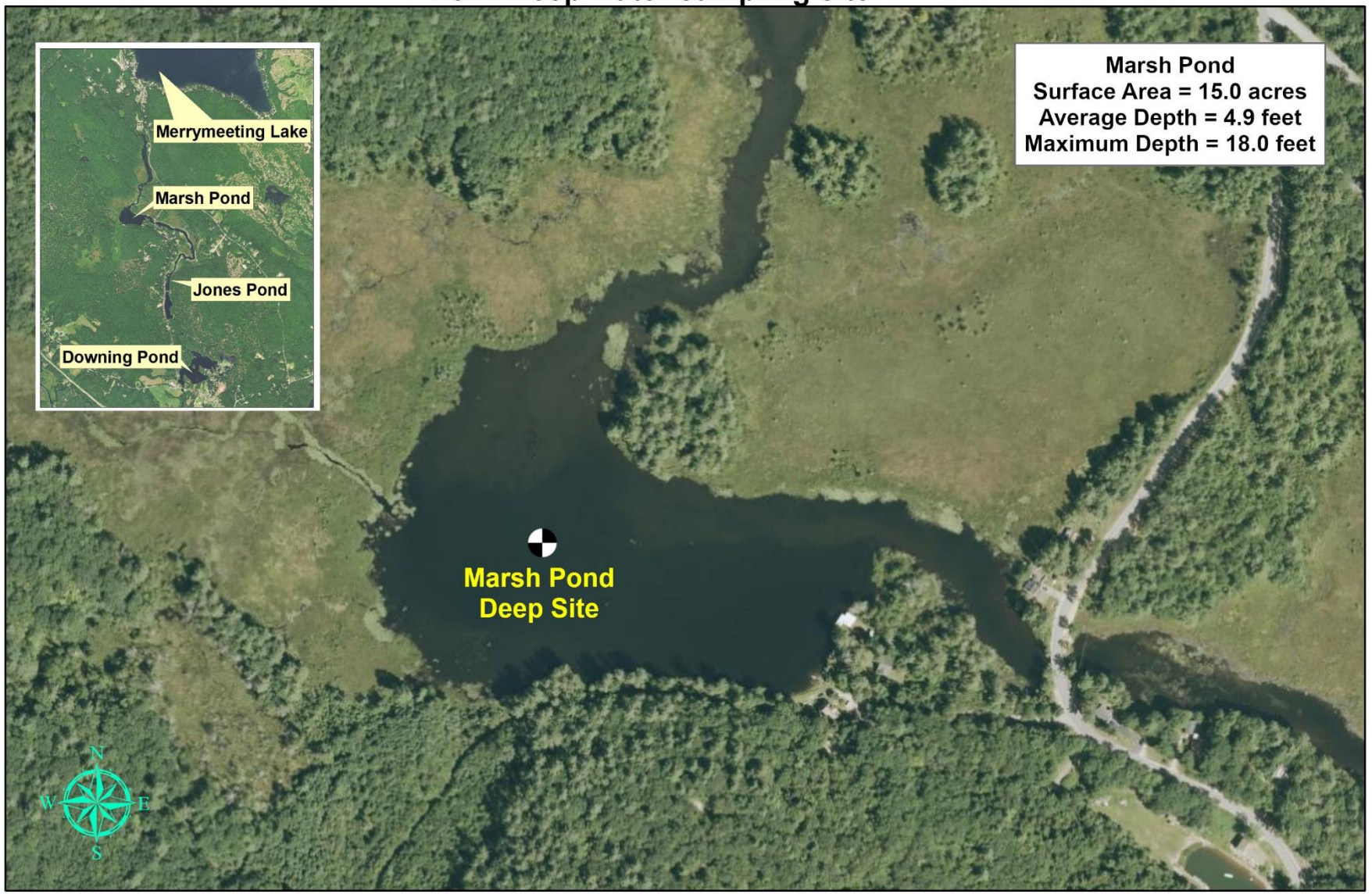
Data Interpretation: Overview of factors to consider when reviewing the Marsh Pond data

This highlight report provides a general overview of the current and historical conditions of Marsh 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 (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 8).

Figure 10. Marsh Pond

New Durham, NH
2024 Deep water sampling site



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

NH Extension

NEW HAMPSHIRE LAKES LAY MONITORING

MERRYMEETING LAKE

2024 SAMPLING HIGHLIGHTS

Station 1 Broad Cove

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 bi-weekly samples collected between May 28 and October 1, 2024.

Blue = Oligotrophic

Light Green = Mesotrophic

Dark Green = Eutrophic

Gray = No Data

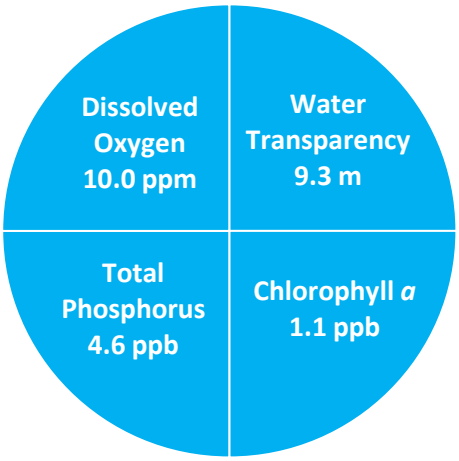


Figure 1. Merrymeeting Lake Water Quality (2024)

Table 1. 2024 Merrymeeting Lake Seasonal Averages and NH DES Aquatic Life Nutrient Criteria[1]

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Merrymeeting Lake Site 1 Broad Cove Average (range)	Merrymeeting Lake Site 1 Broad Cove Classification
Water Clarity (meters)	> 4.0 – 7.0	2.5 - 4.0	< 2.5	**9.3** meters (7.0 – 10.5)	Oligotrophic
Chlorophyll *a* [1] (ppb)	< 3.3	> 3.3 – 5.0	> 5.0 – 11.0	**1.1** ppb (0.4 – 1.7)	Oligotrophic
Total Phosphorus [1] (ppb)	< 8.0	> 8.0 – 12.0	> 12.0 – 28.0	**4.6** ppb (3.1 – 8.6)	Oligotrophic
Dissolved Oxygen (ppm)	> 5.0 – 7.0	2.0 – 5.0	<2.0	**10.0** ppm (6.7 – 12.6) *	Oligotrophic

* Dissolved oxygen concentrations were measured on July 27, 2024, between 11.0 and 36.0 meters, in the cold bottom water layer.

Table 2. 2024 Merrymeeting Lake Seasonal Average Accessory Water Quality Measurements

Parameter	Assessment Criteria					Merrymeeting Lake Site 1 Broad Cove Average (range)	Merrymeeting Lake Site 1 Broad Cove Classification
Color (color units)	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored	**8.4** color units (range: 3.2 – 15.1)	Uncolored
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 – 8.2)	Moderately vulnerable
pH (std units)	< 5.5 suboptimal for successful growth and reproduction		6.5 – 9.0 optimal range for fish growth and reproduction			**7.0** standard units (single value)	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		**52.2** *u*S/cm (single value)	Characteristic of lakes with some human influence

Strategies to stabilize and improve water quality

Implement Best Management Practices (BMPs) within the Merrymeeting Lake watershed to minimize the adverse impacts of polluted runoff and erosion into Merrymeeting Lake. Refer to "Landscaping at the Water's Edge: An Ecological Approach", "New Hampshire Homeowner's Guide to Stormwater Management: Do-It-Yourself Stormwater Solutions for Your Home", and the "Merrymeeting Lake & River Watershed Management Plan" that provides background information and offers potential solutions to existing water quality problems and for more information on how to reduce nutrient loading caused by overland runoff. NH Lakes also provides a series of resources aimed at educating residents and protecting our lakes and ponds through the LakeSmart program.

Figure 2. Merrymeeting Lake (2024 Seasonal Data)

Secchi Disk Transparency and Chlorophyll *a* Data

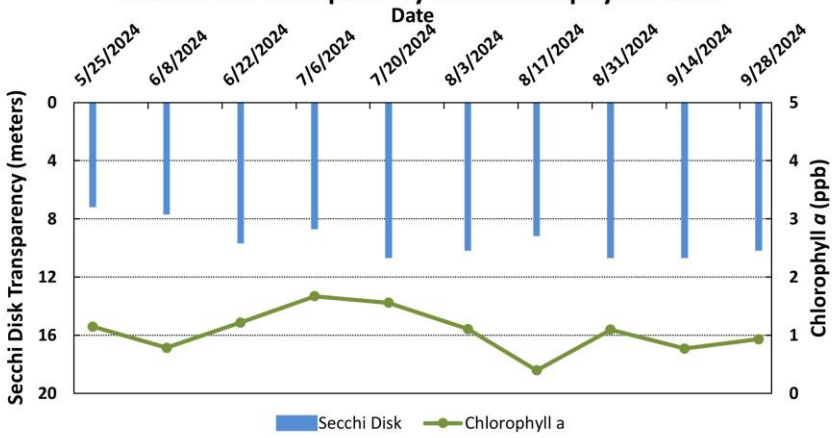


Figure 3. Merrymeeting Lake (2024 Seasonal Data)

Secchi Disk Transparency and Dissolved Color Data

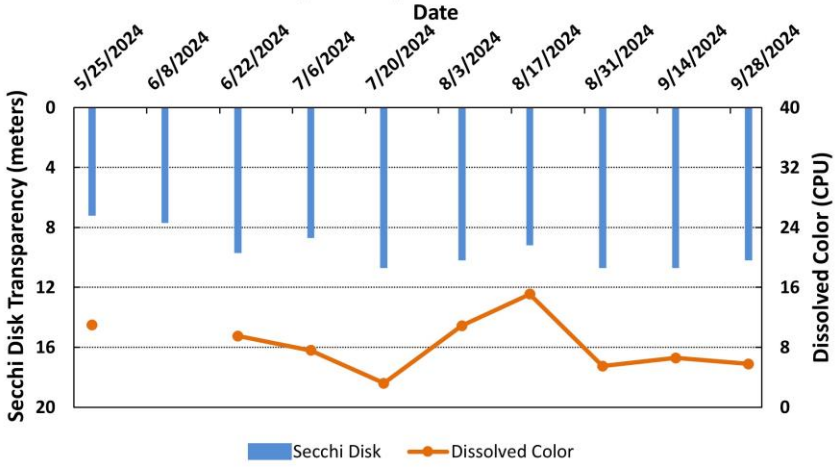


Figure 4. Merrymeeting Lake - Site 1 Broad Cove (1981-2024)

Long-term Secchi Disk Transparency and Chlorophyll *a* Data

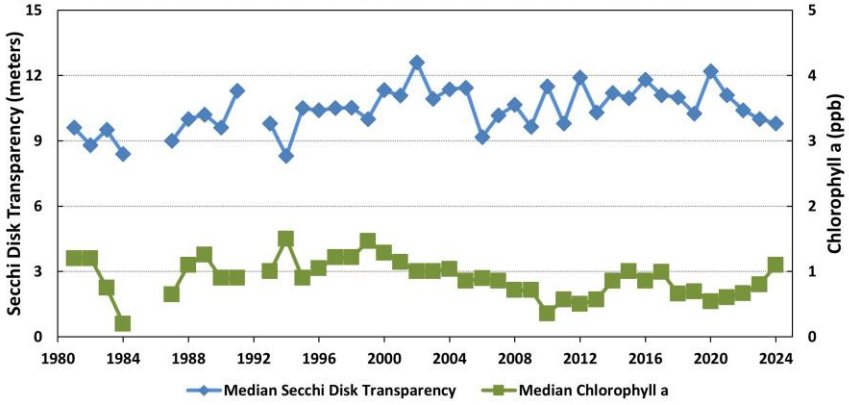
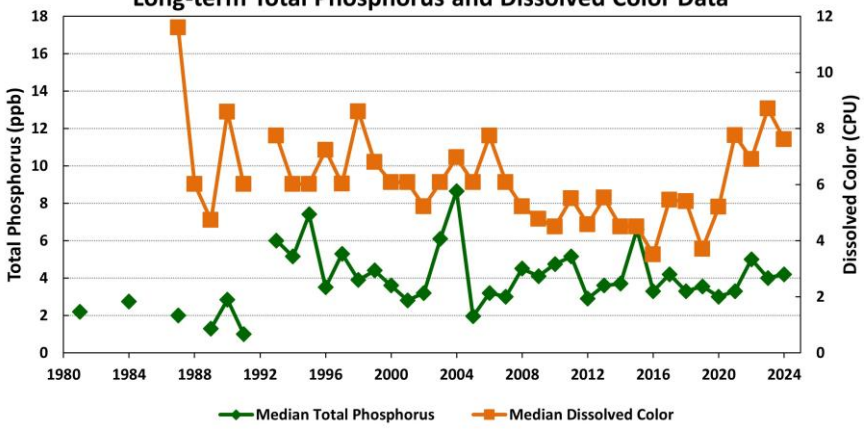


Figure 5. Merrymeeting Lake - Site 1 Broad Cove (1981-2024)

Long-term Total Phosphorus and Dissolved Color Data



Figures 2 and 3. Seasonal comparison of Merrymeeting Lake – Site 1 Broad Cove, water transparency (Secchi Disk depth), chlorophyll *a,* and dissolved color for 2024. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll *a* and/or color concentrations.

Figures 4 and 5. Annual median Merrymeeting Lake – Site 1 Broad Cove, water transparency, chlorophyll *a*, dissolved color, and total phosphorus concentrations measured between 1981 and 2024, 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 Merrymeeting Lake.

Figure 6. Merrymeeting Lake - Site 1 Broad Cove

Temperature Profiles (July 23, 2024)

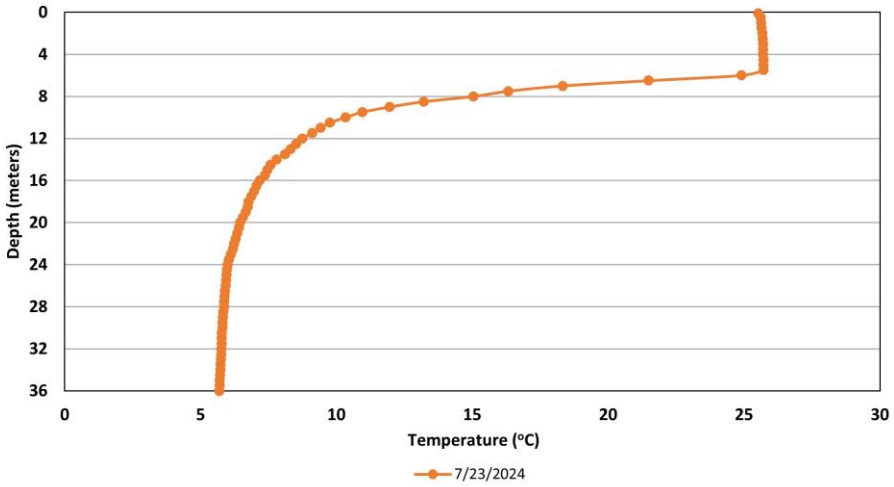


Figure 7. Merrymeeting Lake - Site 1 Broad Cove

Dissolved Oxygen Profiles (July 23, 2024)

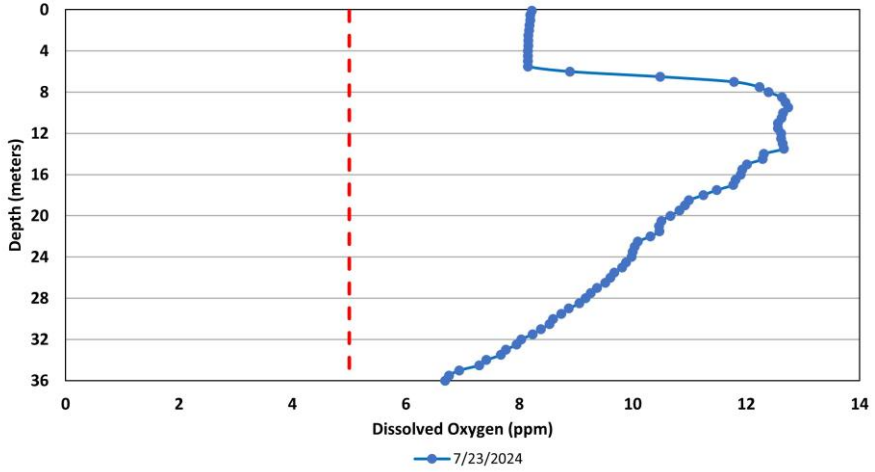


Figure 8. Merrymeeting Lake - Site 1 Broad Cove

Specific conducitivity inter-comparison (July 23, 2024)

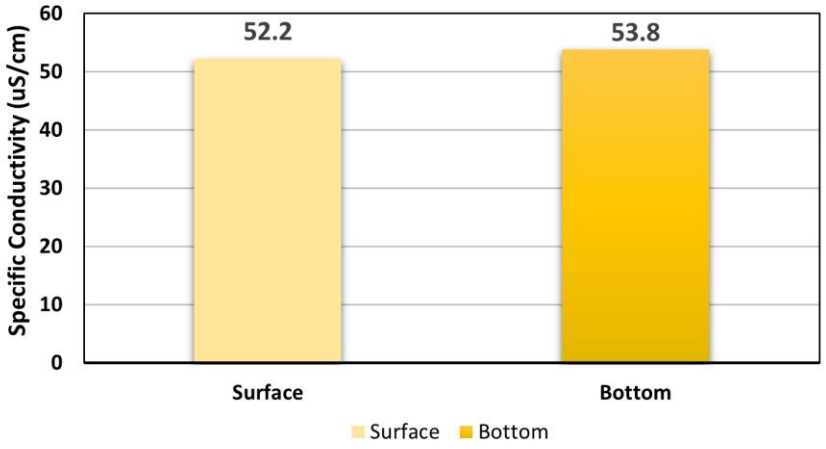
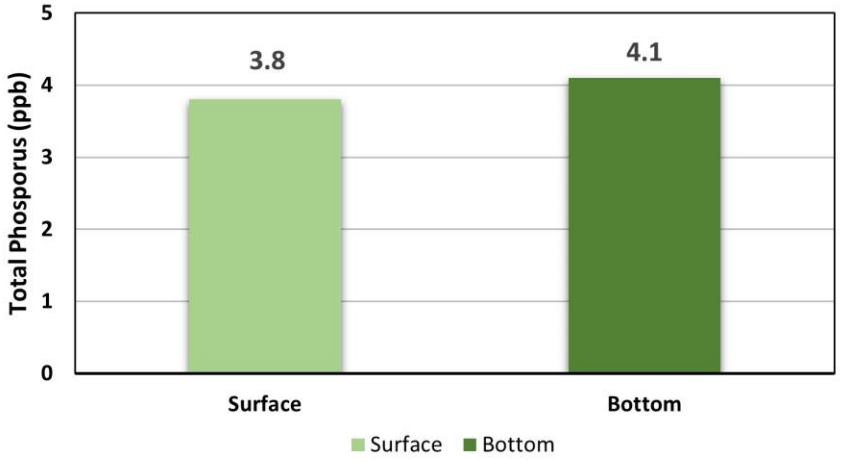


Figure 9. Merrymeeting Lake - Site 1 Broad Cove

Total Phosphorus inter-comparison (July 23, 2024)



Figures 6 and 7. Temperature and dissolved oxygen display the water quality differences in 0.5-meter increments. The dashed vertical red line in Figure 7 displays the dissolved oxygen threshold for the successful growth and reproduction of cold-water fish such as trout and salmon.

Figures 8 and 9. Specific conductivity and total phosphorus comparison between the surface (epilimnion) and bottom (hypolimnion) water zones.

Table 3. Merrymeeting Lake Inter-site Comparison
(2024 water quality data collected between May 28 and October 1)

Site	Average (range) Secchi Disk Transparency (meters)	Average (range) Chlorophyll-*a* (ppb)	Average (range) Total Phosphorus (ppb)	Average (range) Dissolved Oxygen (ppm)
1 Broad Cove	9.3 meters (range: 7.0 – 10.7)	1.1 ppb (range: 0.4 – 1.7)	4.6 ppb (range: 3.1 – 8.2)	10.0 ppm (range: 6.7 – 12.6)
2 Owls Head	8.7 meters (range: 6.5 – 10.7)	1.1 ppb (range: 0.7 – 1.8)	4.0 ppb (range: 2.3 – 6.0)	9.8 ppm (range: 5.8 – 12.4)
3 East End	8.5 meters (range: 6.0 – 10.5)	1.2 ppb (range: 0.7 – 1.8)	4.1 ppb (range: 2.1 – 7.9)	11.8 ppm (range: 10.3 – 12.5)

- Dissolved oxygen measurements were collected on July 23, 2024 in the cold bottom water layer

Data Interpretation: Overview of factors to consider when reviewing the Merrymeeting Lake data

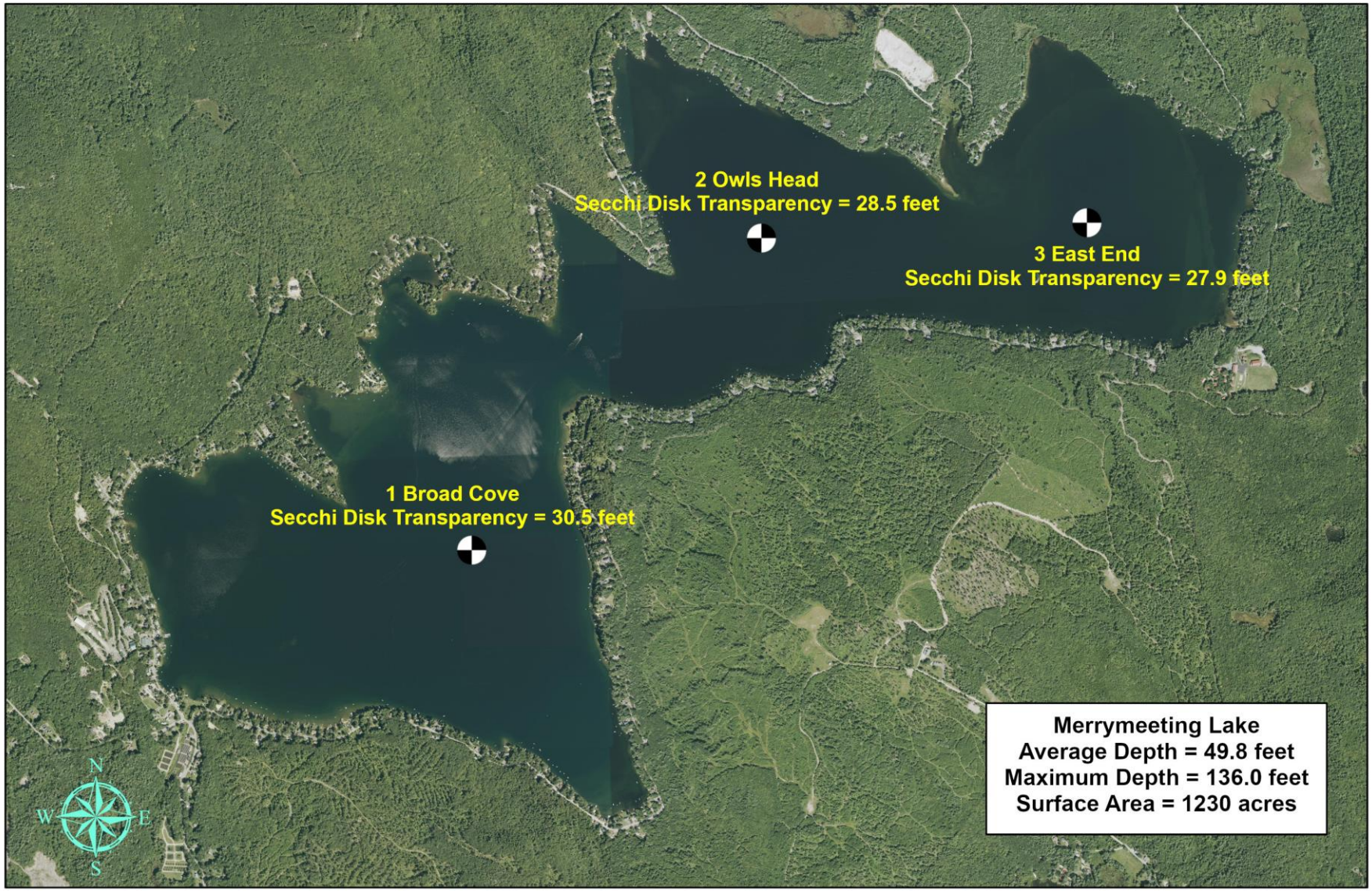
This highlight report provides a general overview of the current and historical conditions of Merrymeeting Lake. The report is intended to provide a simple assessment of the water quality trends. Should you have additional questions about interpreting your water quality results, we would be happy to 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 9).
- **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, during the summer months.

Figure 10. Merrymeeting Lake

New Durham, NH

2024 Deep water sampling site locations with seasonal average water clarity



Site location GPS coordinates were collected by the UNH Center for Freshwater Biology

NH Extension

NEW HAMPSHIRE LAKES LAY MONITORING

SHAWS POND

2024 SAMPLING HIGHLIGHTS

Station Deep

New Durham, NH

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 29 and October 31, 2024.

Blue = Oligotrophic

Light Green = Mesotrophic

Dark Green = Eutrophic

Gray = No Data

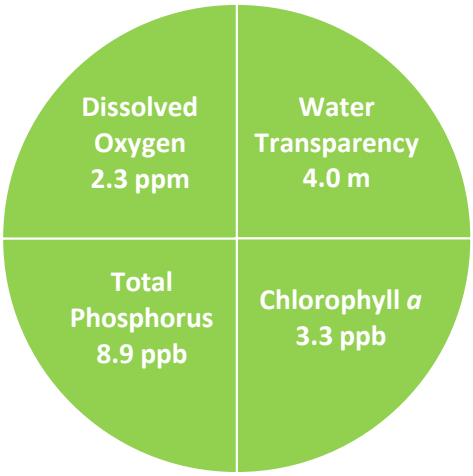


Figure 1. Shaws Pond Water Quality (2024)

Table 1. 2024 Shaws Pond Seasonal Averages and NH DES Aquatic Life Nutrient Criteria[1]

Parameter	Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "Poor"	Shaws Pond Average (range)	Shaws Pond Classification
Water Clarity (meters)	> 4.0 – 7.0	2.5 - 4.0	< 2.5	**4.0** meters (3.4 – 4.5)	Mesotrophic
Chlorophyll *a* [1] (ppb)	< 3.3	3.3 – 5.0	> 5.0 – 11.0	**3.3** ppb (2.1 – 5.2)	Mesotrophic
Total Phosphorus [1] (ppb)	< 8.0	8.0 – 12.0	> 12.0 – 28.0	**8.9** ppb (7.8 – 9.9)	Mesotrophic
Dissolved Oxygen (ppm)	> 5.0 – 7.0	2.0 – 5.0	< 2.0	**2.3** ppm (0.2 – 6.4) *	Mesotrophic

* Dissolved oxygen concentrations were measured between 4.0 and 5.0 meters, in the middle layer, on August 26, 2024.

Table 2. 2024 Shaws Pond Seasonal Average Accessory Water Quality Measurements

Parameter	Assessment Criteria					Shaws Pond Average (range)	Shaws Pond Classification
Color (color units)	< 10 uncolored	10 – 20 slightly colored	20 – 40 lightly tea colored	40 – 80 tea colored	> 80 highly colored	**27.9** color units (range: 20.7 – 35.1)	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	**9.7** ppm (range: 8.1 – 11.1)	Moderately vulnerable
pH (std units)	< 5.5 suboptimal for successful growth and reproduction		6.5 – 9.0 optimal range for fish growth and reproduction			**7.1** standard units (range: 6.8 – 7.5)	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		**81.2** *u*S/cm (range: 75.0 – 86.0)	Characteristic of lakes with some human influence

Strategies to stabilize and improve water quality

Implement Best Management Practices (BMPs) within the Shaws Pond watershed to minimize the adverse impacts of polluted runoff and erosion into Shaws 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 runoff. NH Lakes also provides a series of resources aimed at educating residents and protecting our lakes and ponds through the LakeSmart program.

Figure 2. Shaws Pond (2024 Seasonal Data)
Secchi Disk Transparency and Chlorophyll *a* Data

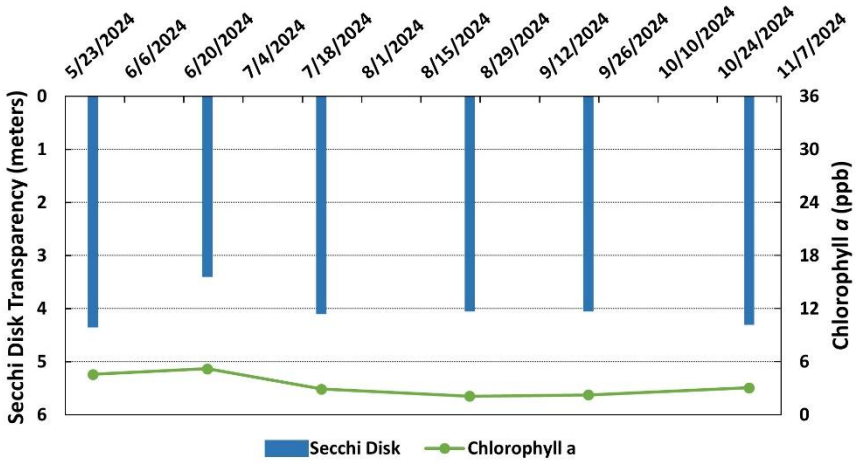


Figure 3. Shaws Pond (2024 Seasonal Data)
Secchi Disk Transparency and Dissolved Color Data

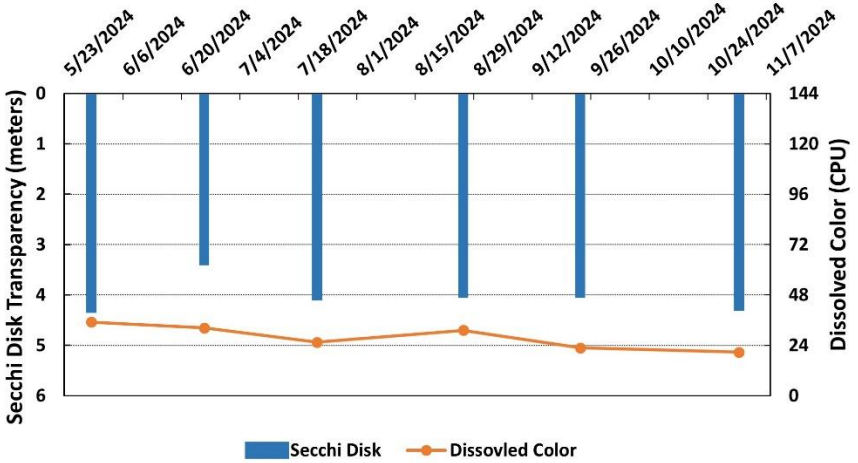


Figure 4. Shaws Pond - Deep Site (1984-2024)
Long-term Secchi Disk Transparency and Chlorophyll *a* Data

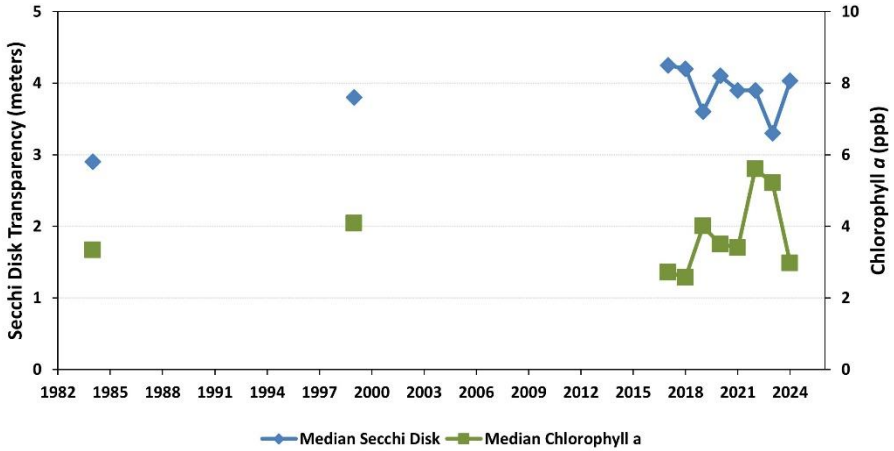
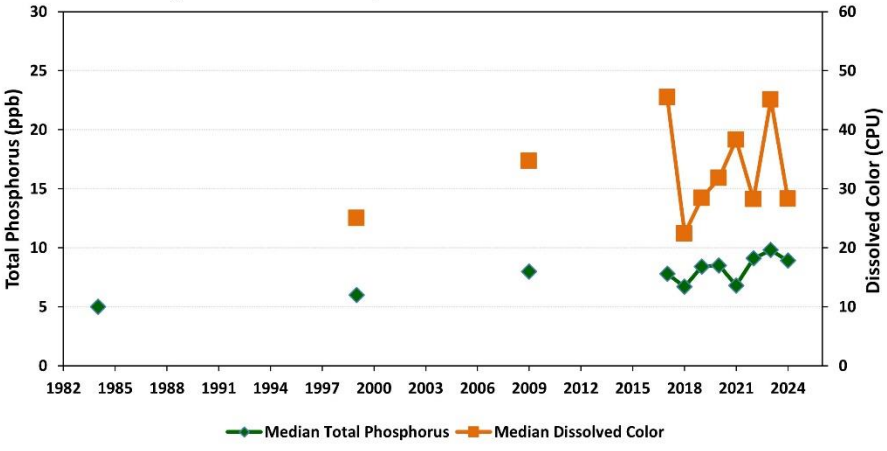
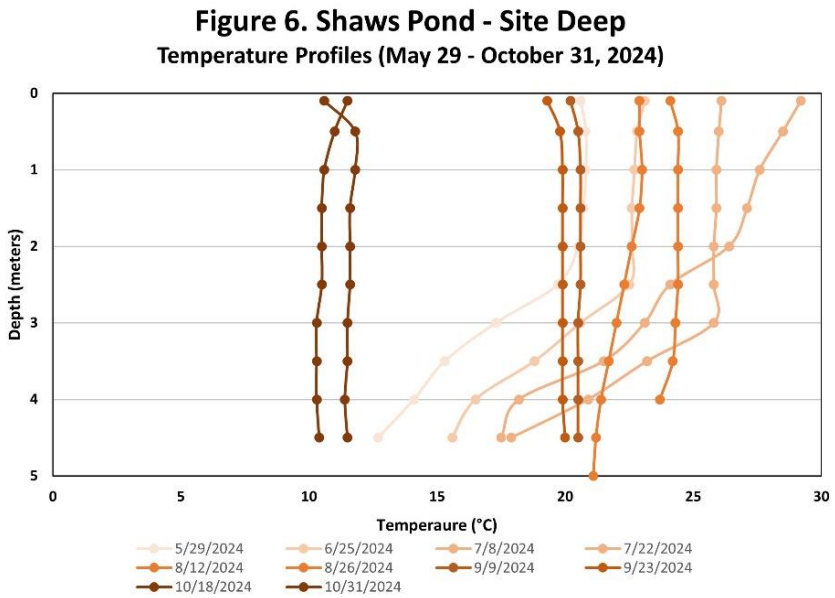


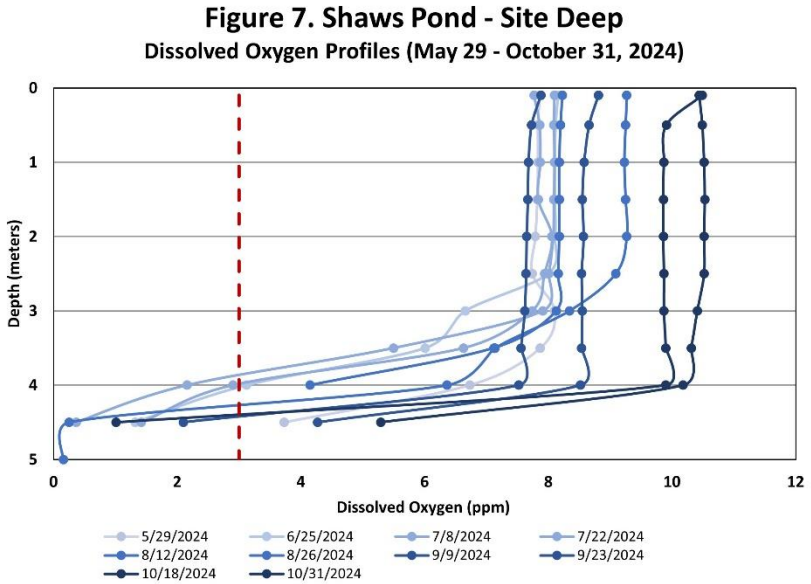
Figure 5. Shaws Pond - Deep Site (1984-2024)
Long-term Total Phosphorus and Dissolved Color Data

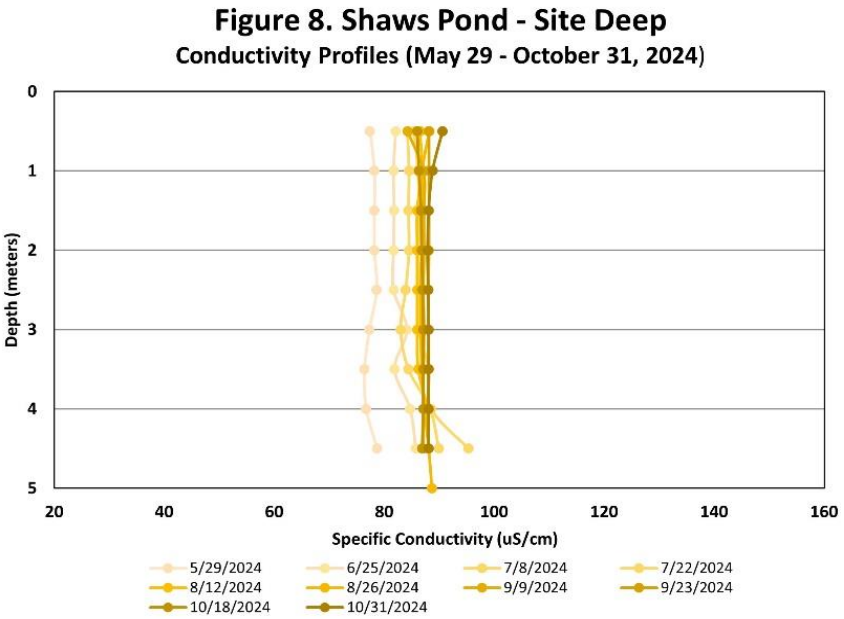


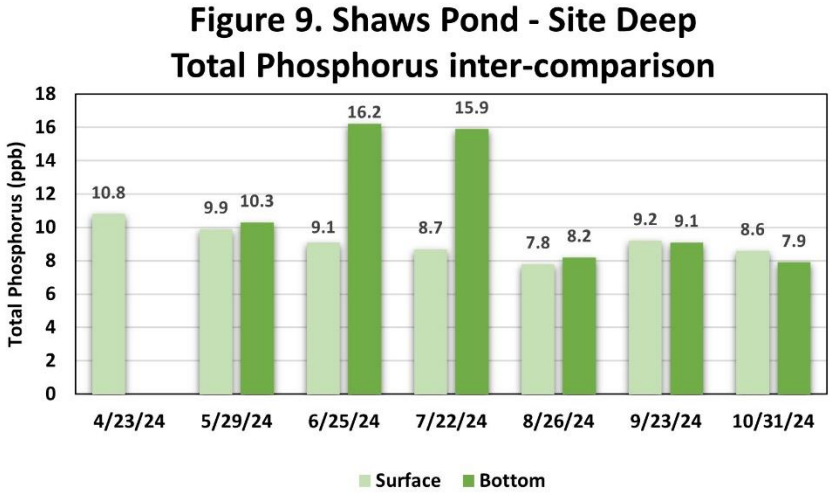
Figures 2 and 3. Seasonal comparison of Shaws Pond water transparency (Secchi Disk depth), chlorophyll *a,* and dissolved color for 2024. Shallower water transparency measurements oftentimes correspond to increases in chlorophyll *a* and/or color concentrations.

Figures 4 and 5. Annual median Shaws Pond water transparency, chlorophyll *a*, dissolved color, and total phosphorus concentrations measured between 1984 and 2024, through the New Hampshire Lakes Lay Monitoring Program and the New Hampshire Department of Environmental Services**.** The long-term data provide insight into the water quality fluctuations, among years, that have been documented in Shaws Pond.









Figures 6, 7, and 8. Temperature, dissolved oxygen, and specific conductivity profiles display the water quality differences in 0.5-meter increments. 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 zones.

Figure 10. Shaws Pond - 2024 Tributary Inter-site Comparison Total Phosphorus Concentrations

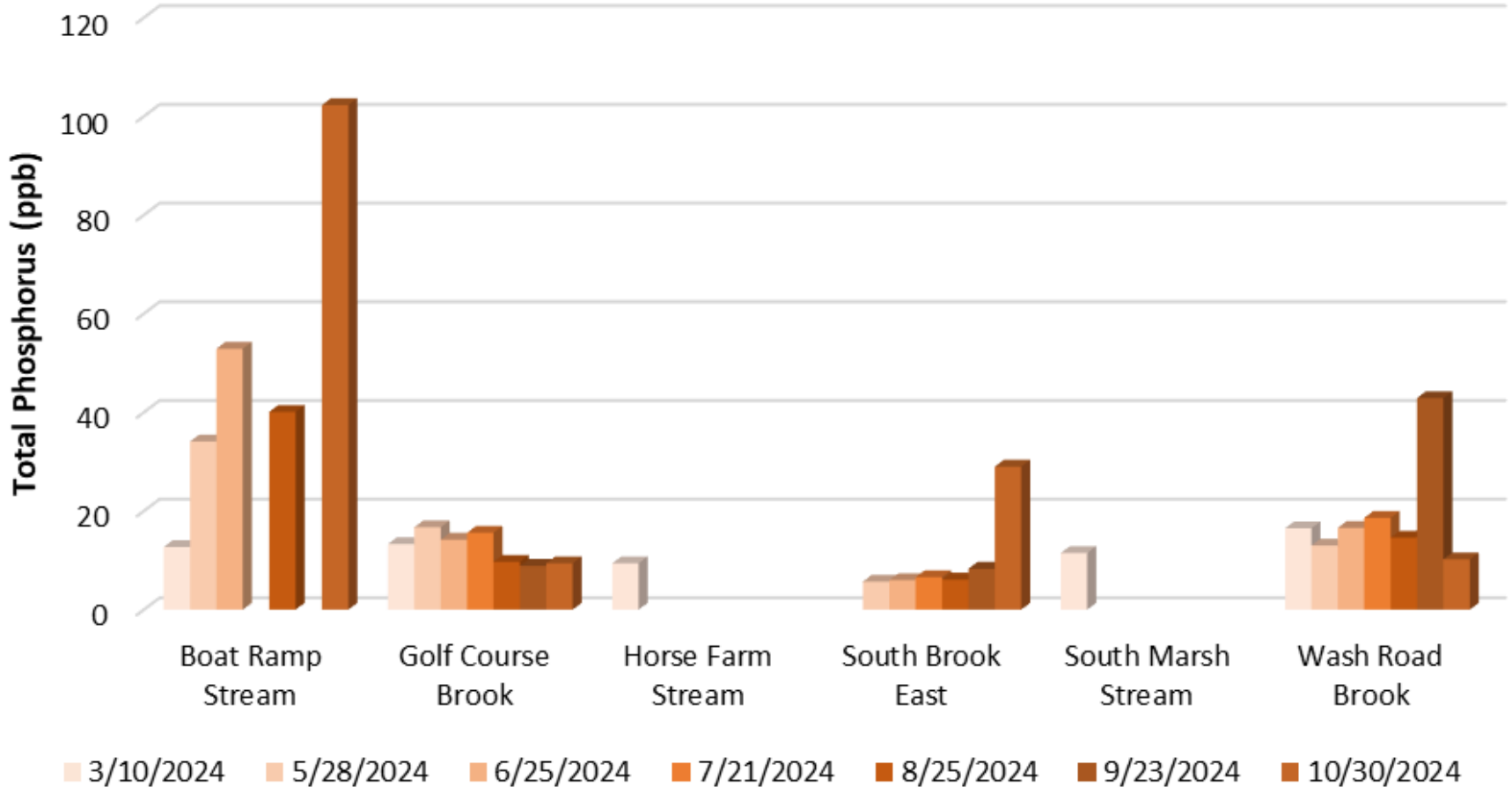


Figure 10. Shaws Pond tributary total phosphorus inter-site comparison. The vertical bars display the total phosphorus concentrations collected between March 10 and October 30, 2024.

Table 3. New Durham Lake/Pond Inter-comparison
(2024 water quality data collected between May 20 and October 31)

Lake	Average (range) Secchi Disk Transparency (meters)	Average (range) Chlorophyll-*a* (ppb)	Average (range) Total Phosphorus (ppb)	Average (range) Dissolved Oxygen (ppm)
Chalk Pond	2.6 meters (range: 2.1 – 3.0)	3.0 ppb (range: 2.1 – 5.2)	10.2 ppb (range: 9.2 – 12.1)	------
Downing Pond	2.6 meters (range: 2.1 – 3.0)	6.9 ppb (range: 3.9 – 10.2)	23.9 ppb (range: 20.5 – 26.4)	------
Jones Pond	2.6 meters (range: 2.1 – 3.3)	7.5 ppb (range: 4.2 – 10.2)	23.6 ppb (range: 18.8 – 29.0)	------
Marchs Pond	3.8 meters (range: 2.1 – 6.3)	4.8 ppb (range: 3.3 – 9.0)	10.5 ppb (range: 6.7 – 15.2)	------
Marsh Pond	2.6 meters (range: 2.0 – 3.4)	7.1 ppb (range: 3.9 – 11.6)	25.2 ppb (range: 17.4 – 32.2)	0.5 ppm (range: 0.3 – 0.7)
Merrymeeting Lake	9.3 meters (range: 7.0 – 10.5)	1.1 ppb (range: 0.4 – 1.7)	4.7 ppb (range: 3.1 – 8.6)	10.0 ppm (range: 6.7 – 12.6)
Shaws Pond	4.0 meters (range: 3.4 – 4.5)	3.3 ppb (range: 2.1 – 5.2)	8.9 ppb (range: 7.8 – 9.9)	2.3 ppm (range: 0.2 – 6.4)

- 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
- ------ indicates the site is too shallow to form a bottom water layer

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

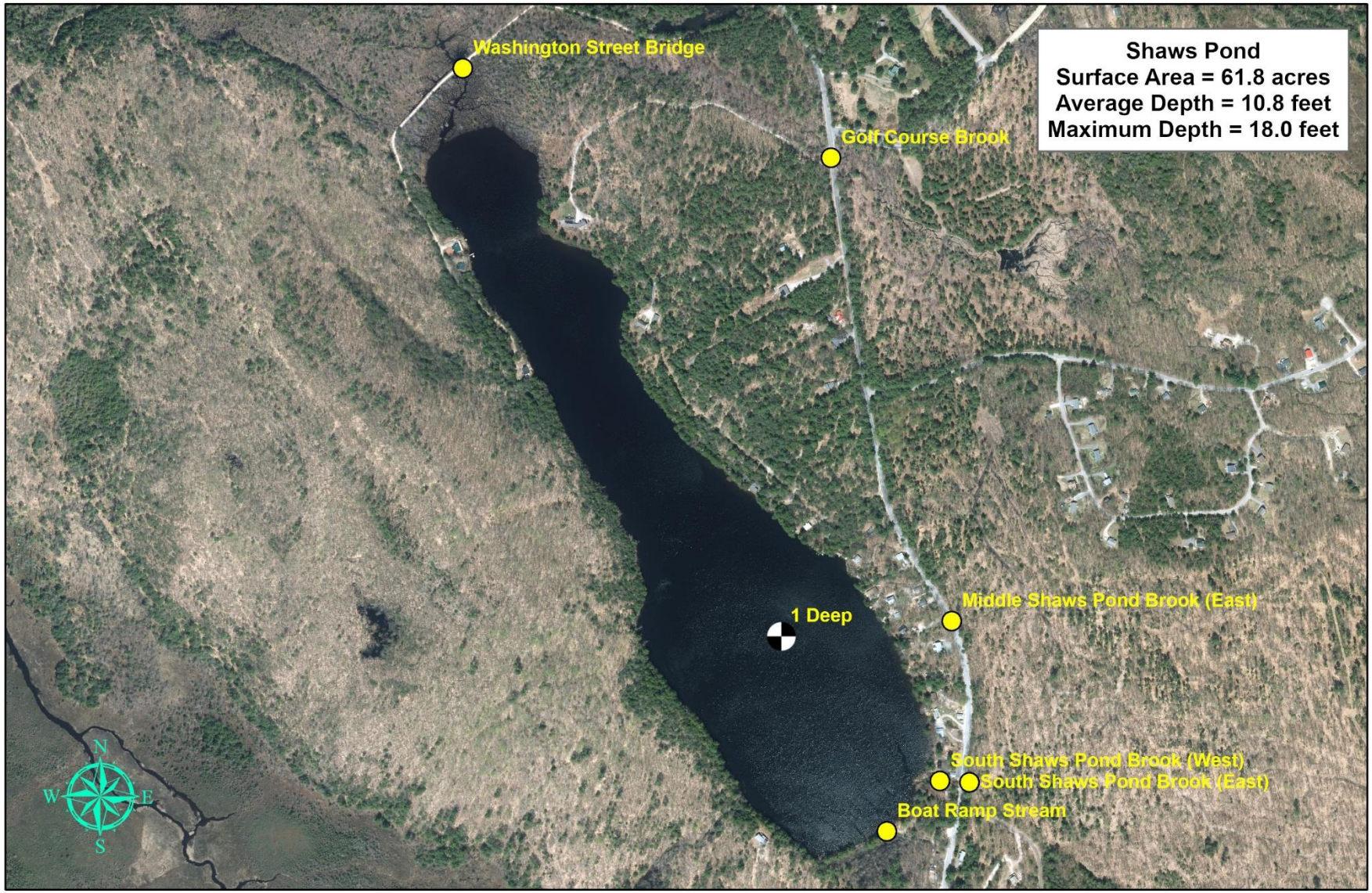
This highlight report provides a general overview of the current and historical conditions of Shaws Pond. The report is intended to provide a simple assessment of the water quality trends. Should you have additional questions about interpreting your water quality results, we would be happy to discuss 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.
- **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, during the summer months.

Figure 10. Shaws Pond

New Durham, NH

2024 Deep and tributary sampling locations



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

NH Extension

NEW HAMPSHIRE LAKES LAY MONITORING