

# 2025 Volunteer Lake Assessment Program

## Individual Report: Clough Pond – Loudon

**Water Quality Summary:** Pond quality is generally representative of mesotrophic, or average, conditions, with moderate levels of phosphorus and algal growth. Historical trend analysis indicates stable levels for epilimnetic (upper water layer) and hypolimnetic (bottom water layer) phosphorus, chlorophyll, pH levels and transparency. Epilimnetic conductivity levels are worsening (increasing) but remain lower after a spike in 2022. Highly elevated hypolimnetic phosphorus levels suggest the potential for an internal load of phosphorus from bottom sediments under anoxic (low dissolved oxygen) conditions in late summer. This internal load of phosphorus is readily available for uptake by algae/cyanobacteria and could fuel late summer cyanobacteria blooms. On average, Clough Pond has lower (worse) water quality compared to the median New Hampshire lake but doesn't exceed any New Hampshire water quality standards.

**Recommended Actions:** The chlorophyll, phosphorus and turbidity levels, as well as dissolved oxygen profiles indicates a layer of cyanobacteria growth in Metalimnetic waters. Cyanobacteria are adapted to take advantage of warmer water temperatures and lower light conditions to take up nutrients from deeper in the water column. The internal load of nutrients from bottom sediments likely helps to fuel this growth. Continue to report any suspicious algal/cyanobacteria growth to NHDES' [Harmful Algal Bloom Program](#). Continue efforts to manage stormwater runoff in the watershed. Encourage shoreline property owners to be certified [LakeSmart](#) through NH LAKES' lake-friendly living program. Educate shoreline property owners on proper [septic system](#) maintenance to further help reduce nutrient loading to the pond. Keep up the great work and thank you for your continued participation in VLAP!

### Historical Water Quality Trend Analysis

Table 1. Historical Water Quality Trends for Clough Pond – Loudon

Parameter	Trend
Conductivity (Epilimnion)	Worsening
Chlorophyll-a (Composite)	Stable
pH (Epilimnion)	Stable
Transparency	Stable
Phosphorus (Epilimnion)	Stable
Phosphorus (Hypolimnion)	Stable

## Historical Water Quality Graphics - Deep Spot

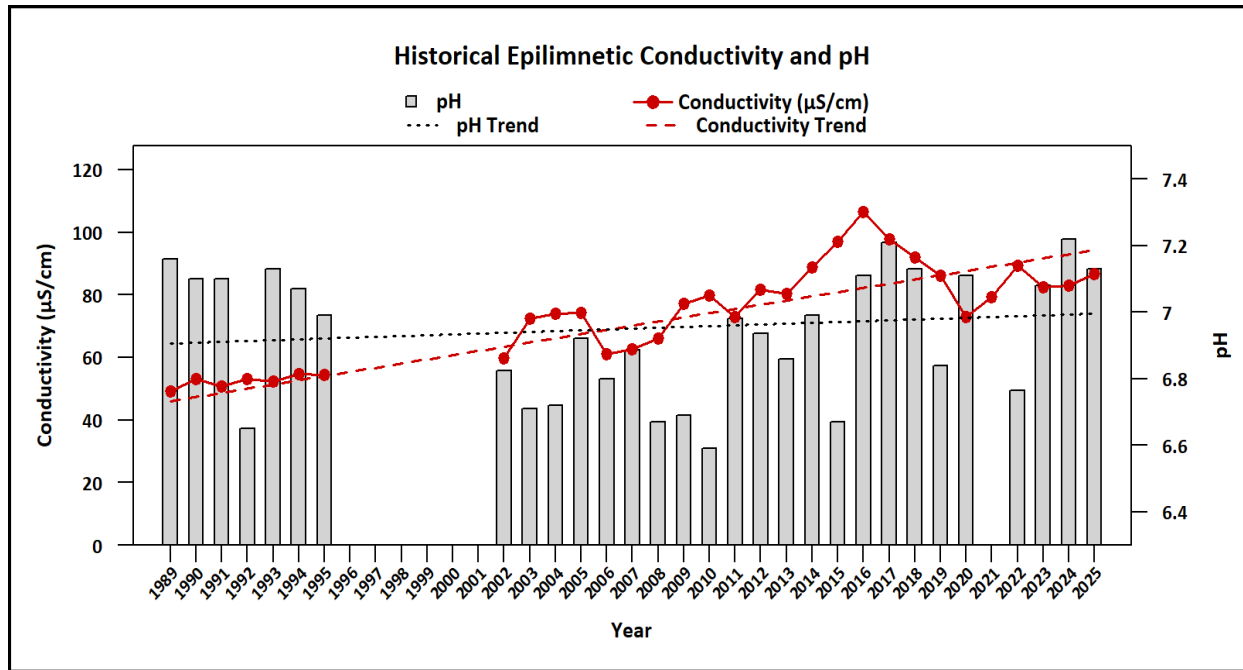


Figure 1. Median epilimnetic pH (gray bars) and conductivity (red points) by year, with corresponding trend lines shown as black and red dashed lines, respectively. Epilimnetic pH is stable and conductivity is worsening since monitoring began.

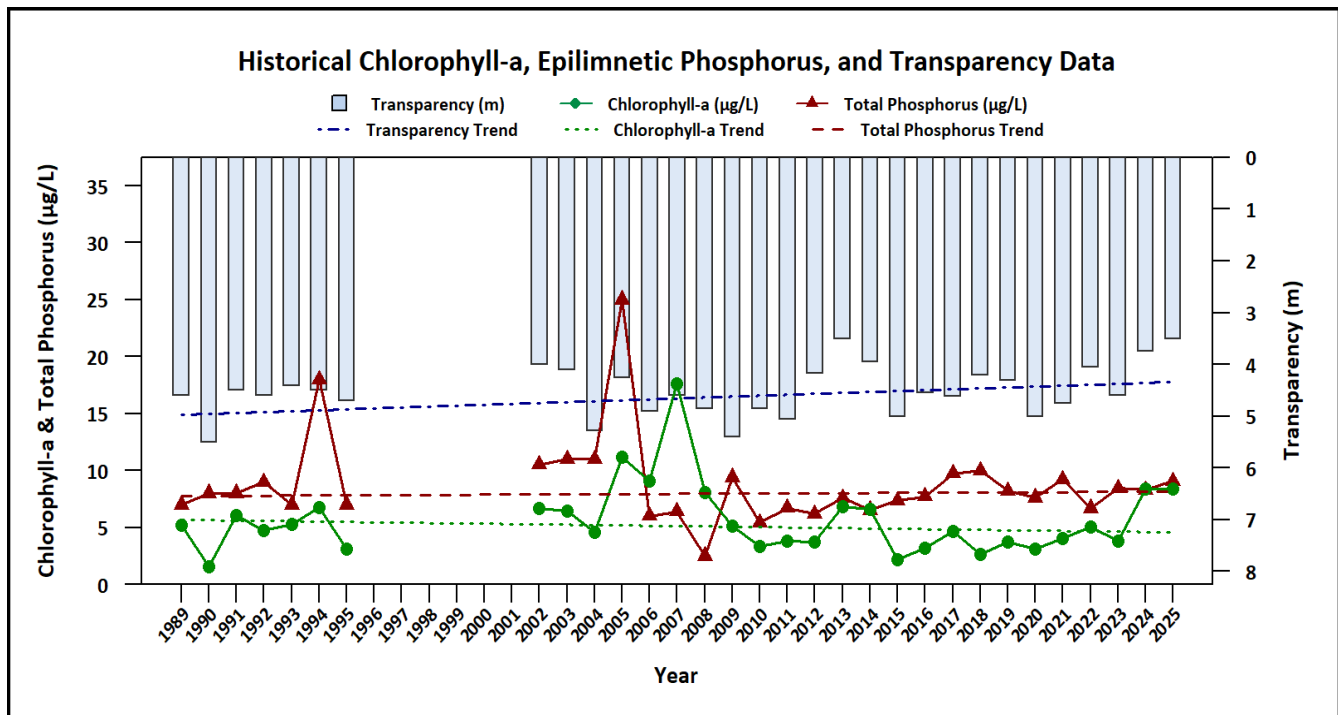


Figure 2. Median Secchi disk transparency (blue bars), epilimnetic phosphorus (red triangles), and chlorophyll-a (green points) by year, with corresponding trend lines shown as blue, red, and green dashed lines, respectively. Water transparency is stable, phosphorus is stable, and chlorophyll-a is stable since monitoring began.

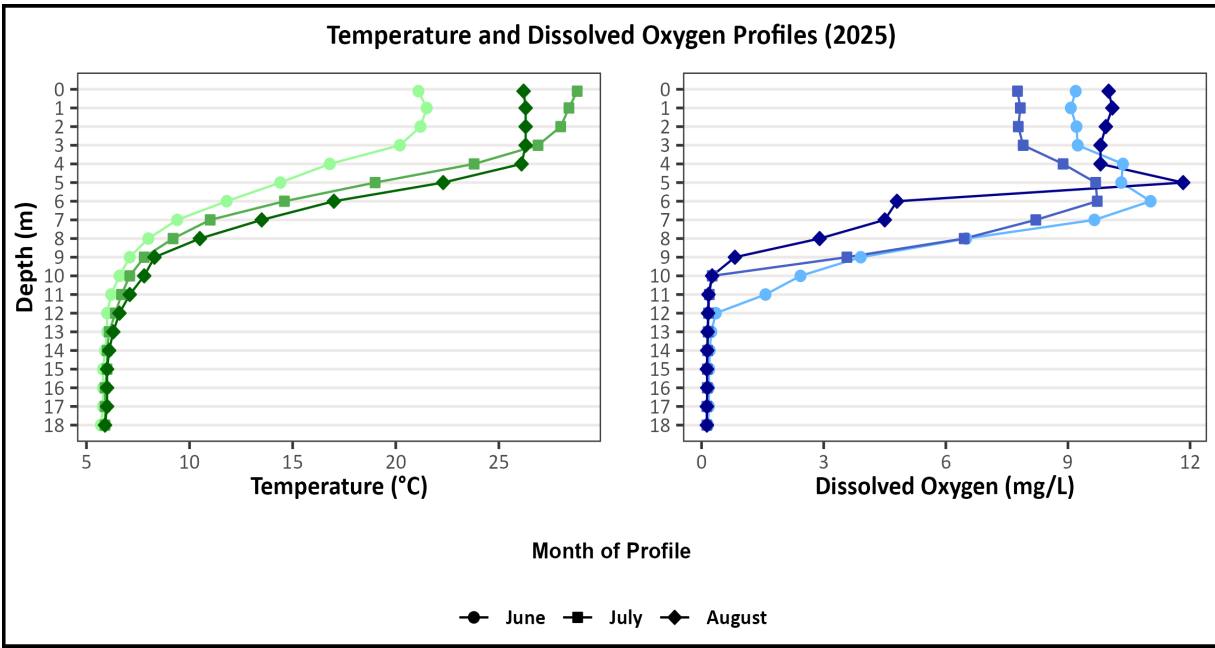


Figure 3. 2025 vertical profiles of temperature (°C; green points, left plot) and dissolved oxygen (mg/L; blue points, right plot) plotted against depth (m). Profile month is indicated by point shape and color intensity, with lighter shades representing earlier-season samples and darker shades representing later-season samples.

Table 2. 2025 Average Water Quality Data for Clough Pond – Loudon

Station	Alk. (mg/L)	Chlor-a (µg/L)	Chloride (mg/L)	Color (pcu)	Cond. (µS/cm)	Total P (µg/L)	Trans. NVS (m)	Trans. VS (m)	Turb. (ntu)	pH
Epilimnion	8.47	6.8	14.6	28.33	85.73	9.26	3.12	3.22	0.96	7.75
Metalimnion	No Value	No Value	No Value	No Value	83.12	19.20	No Value	No Value	2.40	6.66
Hypolimnion	No Value	No Value	No Value	No Value	90.55	31.33	No Value	No Value	3.33	6.35
Inlet	No Value	No Value	12.72	No Value	80.39	20.97	No Value	No Value	3.22	7.42
Outlet	No Value	No Value	13.43	No Value	87.69	10.88	No Value	No Value	1.10	7.68

**Observations (Refer to Table 2 and Historical Deep Spot Data Graphics):**

- **Chlorophyll-a (Chlor-a):** Chlorophyll level was low in July but elevated in June and August. The median chlorophyll level was stable with 2024 levels and was greater than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates stable chlorophyll levels since monitoring began.
- **Conductivity (Cond.)/Chloride:** Epilimnetic, Metalimnetic (middle water layer), Hypolimnetic, Inlet and Outlet conductivity and/or chloride levels remained greater than the state medians, yet less than a level of concern. Historical trend analysis indicates significantly worsening (increasing) epilimnetic conductivity levels since monitoring began.
- **Color:** Apparent color measured in the epilimnion indicates the water was lightly tea colored in July, but moderately tea colored in June and August.

- Total Phosphorus (Total P):** Epilimnetic phosphorus level was slightly elevated in June and August when algal/cyanobacteria growth was slightly elevated and then decreased to low levels in July. The median epilimnetic phosphorus level remained stable with 2024 and was less than the state median and the threshold for mesotrophic lakes. Metalimnetic phosphorus levels were elevated from June through August potentially due to layers of algae/cyanobacteria. Hypolimnetic phosphorus levels were also elevated and highest in July potentially due to release of phosphorus from bottom sediments under anoxic (no dissolved oxygen) conditions. Historical trend analysis indicates relatively stable epilimnetic and hypolimnetic phosphorus levels since monitoring began. Inlet phosphorus levels were elevated in June when deep spot chlorophyll and phosphorus levels were also elevated. Outlet phosphorus levels fluctuated within a normal range.
- Transparency (Trans.):** Transparency measured without the viewscope (NVS) was average in June and July, then decreased (worsened) to below average in August likely due to cyanobacteria growth. The median NVS transparency decreased (worsened) from 2024 and was lower (worse) than the state median. Historical trend analysis indicates relatively stable NVS transparency since monitoring began. Viewscope (VS) transparency was slightly higher (better) than NVS transparency.
- Turbidity (Turb.):** Epilimnetic turbidity levels fluctuated within a normal range. Metalimnetic turbidity level was elevated likely due to a layer of algae/cyanobacteria. Hypolimnetic turbidity levels were slightly elevated in August. Inlet turbidity levels were elevated in July and August. Outlet turbidity levels fluctuated within a normal range.
- pH:** Epilimnetic, Metalimnetic, Inlet and Outlet pH levels were within the desirable range of 6.5-8.0 units. Historical trend analysis indicates stable epilimnetic pH levels since monitoring began. Hypolimnetic pH levels were slightly acidic and less than desirable.
- Temperature/Dissolved Oxygen (DO) Profile:** The pond was stratified June through August. Epilimnetic temperatures were approximately 20 to 25 °C, with DO concentrations around 8 to 10 mg/L. The metalimnion (thermocline) began at approximately 3.0 m, where temperature declined rapidly and DO increased up to 12 mg/L, likely due to a metalimnetic layer of algae/cyanobacteria growth. By 10.0 m (the hypolimnion), temperatures stabilized around 5 °C and DO concentrations reached 0 mg/L.

### How does your lake compare to New Hampshire lakes and water quality standards?

Table 3. New Hampshire Median Lake Water Quality Values. Median values generated from historic lake monitoring data.

Parameter	Median Value
Alkalinity	4.5 mg/L
Chlorophyll-a	4.39 µg/L
Chloride	5 mg/L
Conductivity	42.3 µS/cm
Total Phosphorus	11 µg/L
Transparency	3.3 m
pH	6.6

Table 4. New Hampshire Water Quality Standards. Numeric criteria for specific parameters. Water quality violation occurs if thresholds are exceeded.

Parameter	Threshold
Chloride	> 230 mg/L (chronic)
E. coli (beach)	> 88 cts/100 mL
E. coli (surface water)	> 406 cts/100 mL
pH	between 6.5-8.0 (unless naturally occurring)
Turbidity	> 10 NTU above natural