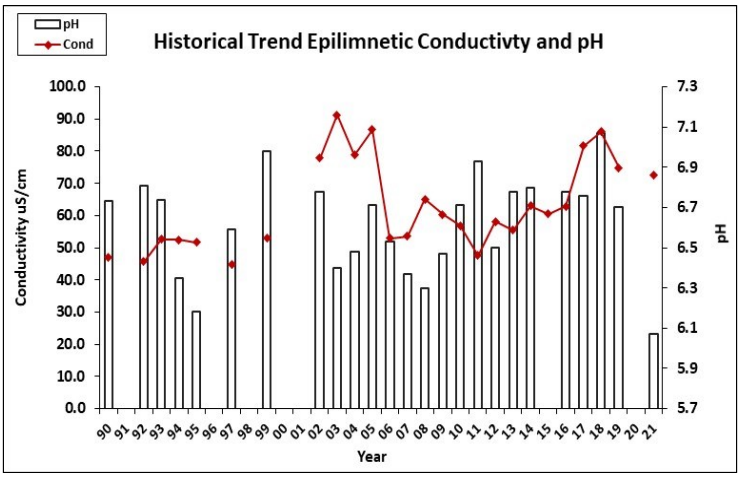
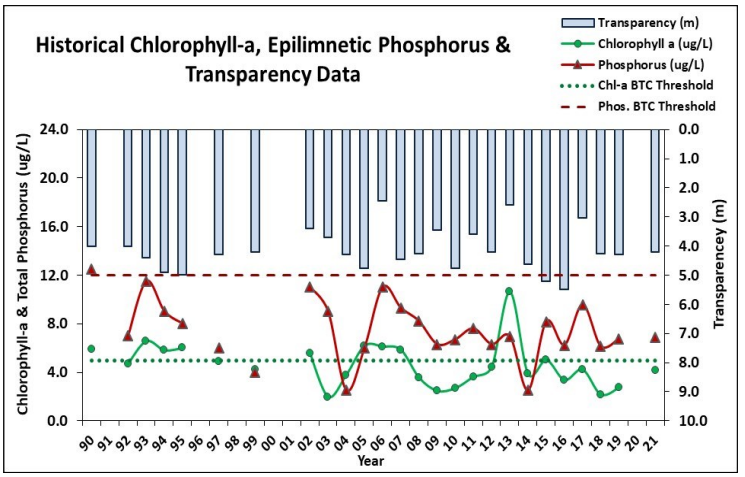
Volunteer Lake Assessment Program Individual Lake Reports
Lake Wicwas, Meredith
2021 Data Summary

Recommended Actions: Pond quality is representative of mesotrophic, or average, conditions. Algal growth occasionally spikes above the threshold for mesotrophic lakes but appears to be stabilizing below the threshold in recent years. Hypolimnetic phosphorus levels have significantly increased since 2002 suggesting an internal load of phosphorus being released into the water column from bottom sediments. This occurs when dissolved oxygen levels are depleted below 1.0 mg/L, as indicated by the dissolved oxygen/temperature profile. This phosphorus is readily available for uptake by algae/cyanobacteria and likely fuels occasional cyanobacteria blooms. Significant rainfall prior to sampling did not negatively impact nutrient or turbidity levels in the lake, which is a positive sign. Continue education and outreach efforts focused on stormwater management within the watershed. Lake conductivity levels have remained within a higher range since 2016 and efforts should be made to manage road salt application within the watershed. Encourage local road agents and private winter maintenance companies to obtain Green SnowPro Certification. Increase monitoring frequency to once per month, typically June, July and August, to better assess seasonal conditions and reduce variability in trend analysis. Keep up the great work!

Historical Water Quality Trend Analysis

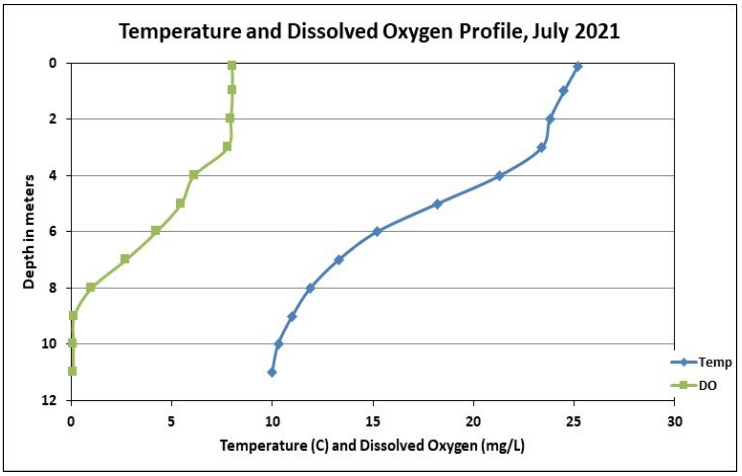
Parameter	Trend	Parameter	Trend
Conductivity	Stable	**Chlorophyll-a**	Stable
pH (epilimnion)	Stable	**Transparency**	Stable
		Phosphorus (epilimnion)	Stable

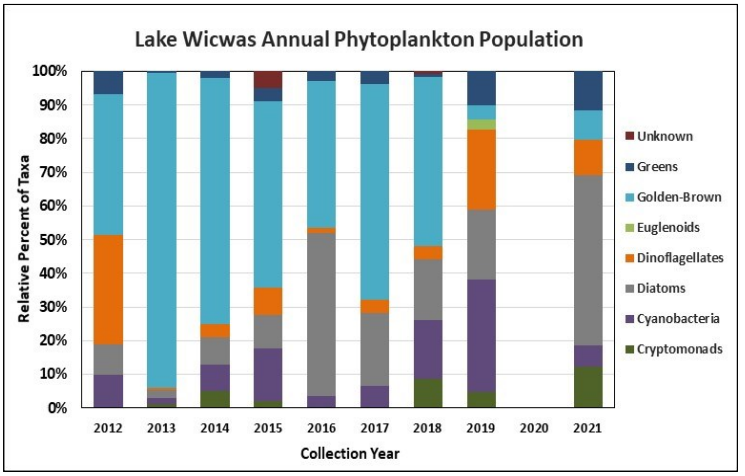




Dissolved Oxygen and Phytoplankton

(Note: Information may not be collected annually)





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Observations (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **Chlorophyll-a:** Chlorophyll level was within a low range in July, increased from 2019, was approximately equal to the state median, and was slightly less than the threshold for mesotrophic lakes. Historical trend analysis indicates stable, yet variable chlorophyll levels since 2002.
- **Conductivity/Chloride:** Epilimnetic (upper water layer), Metalimnetic (middle water layer), Hypolimnetic (lower water layer), East Cove, Outlet, Rt. 104 Inlet, and West Cove conductivity and chloride levels remained slightly greater than the state medians. Chloride levels were much less than the state chronic chloride standard, however increased slightly from 2019 in the Epilimnion, Rt. 104 Inlet and West Cove. Historical trend analysis indicates stable, yet variable, epilimnetic conductivity levels since 2002.
- **Color:** Epilimnetic color data indicates the water was lightly tea colored, or light brown.
- **E. coli:** East Cove, Outlet and Rt. 104 Inlet E. coli levels were very low and much less than the state standards for surface waters.
- **Total Phosphorus:** Epilimnetic phosphorus level was within a low range, remained stable with 2019, and was less than the state median and the threshold for mesotrophic lakes. Historical trend analysis indicates relatively stable epilimnetic phosphorus levels since 2002. Metalimnetic and Outlet phosphorus levels were within a moderate and average range for those stations. Hypolimnetic phosphorus level was elevated and the turbidity of the sample was also elevated indicating release of phosphorus from bottom sediments under anoxic (no dissolved oxygen) conditions. Historical trend analysis indicates significantly increasing (worsening) hypolimnetic phosphorus levels since 2002. East Cove, Rt. 104 Inlet and West Cove phosphorus levels remained within a low range.
- **Transparency:** Transparency measured with (VS) and without (NVS) the viewscope was within an average range for the lake, remained stable with 2019, and was higher (better) than the state median. Historical trend analysis indicates stable, yet variable, NVS transparency since 2002.
- **Turbidity:** Epilimnetic, Metalimnetic, East Cove, Outlet, Rt. 104 Inlet, and West Cove turbidity levels fluctuated within a low to moderate range for those stations. Hypolimnetic turbidity level was elevated and field data note cloudy and colored water due to formation and accumulation of organic compounds under anoxic conditions.
- **pH:** Epilimnetic, Metalimnetic, Hypolimnetic and Outlet pH levels were slightly acidic and less than desirable 6.5-8.0 units likely due to recent record rainfall and impacts of acid precipitation. Historical trend analysis indicates relatively stable epilimnetic pH levels since monitoring began. East Cove, Rt. 104 Inlet and West Cove pH levels were within the desirable range.

Station Name	Table 1. 2021 Average Water Quality Data for LAKE WICWAS - MEREDITH										
	Alk.	Chlor-a	Chloride	Color	Cond.	E. coli (mpn/100mL)	Total P	Trans. (m)		Turb.	pH
								NVS	VS		
Epilimnion	6.2	4.15	22	40	72.6		7	4.20	4.48	0.72	6.07
Metalimnion					69.6		11			0.88	5.94
Hypolimnion					78.8		30			13.85	5.99
East Cove			22		71.1	1	6			0.48	6.72
Outlet					72.4	6	11			0.65	6.38
Rte. 104 Inlet			21		69.1	4	8			0.68	6.50
West Cove			22		71.3		6			0.42	6.74

NH Median Values

Median values generated from historic lake monitoring data.

Alkalinity: 4.5 mg/L **Chlorophyll-a:** 4.39 ug/L
Conductivity: 42.3 uS/cm **Chloride:** 5 mg/L
Total Phosphorus: 11 ug/L **Transparency:** 3.3 m
pH: 6.6

NH Water Quality Standards

Numeric criteria for specific parameters. Water quality violation if thresholds exceeded.

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