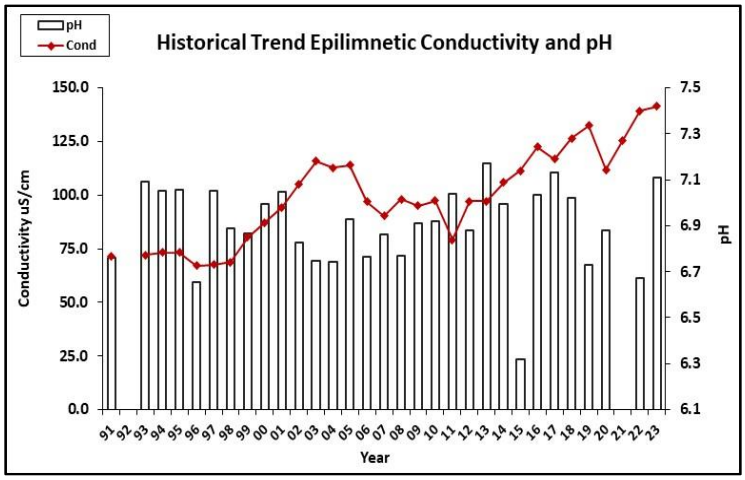
2023 VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
LAKE WAUKEWAN, MAYO STN., MEREDITH

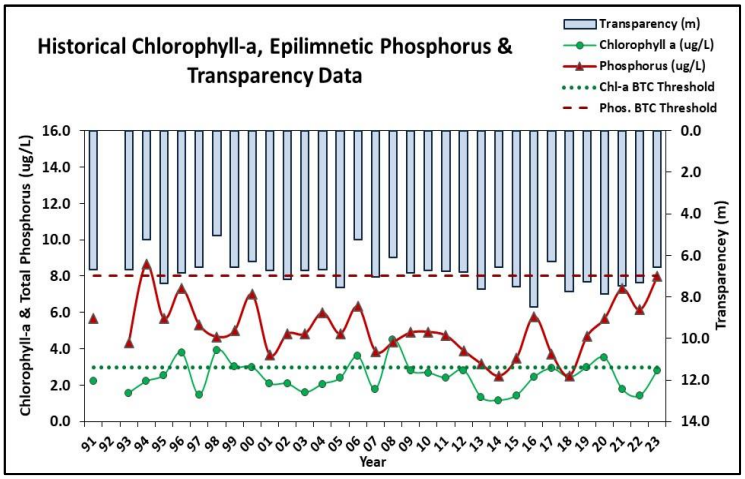
Recommended Actions: Great job sampling in 2023! Lake quality remains representative of oligotrophic, or high-quality conditions, however Epilimnetic (upper water layer) phosphorus (nutrient) levels have increased and have remained within a higher range in recent year. Hypolimnetic phosphorus levels were elevated in late summer indicating potential release of phosphorus from bottom sediments under anoxic (no dissolved oxygen) conditions. This internal load of nutrients in readily available for uptake by algae and cyanobacteria. Keep an eye on the lake in late summer/early fall for any signs of cyanobacteria surface scums or blooms and notify NHDES' Harmful Algal Bloom Program. Spring tributary sampling has historically indicated elevated nutrient levels following spring snowmelt and runoff. Clean up roadside ditches and culverts of any leftover sand/salt mixtures applied to roads during winter months. Excessive summer rainfall did not appear have long-term negative impacts to water quality which is a positive sign. Continue watershed management efforts to reduce nutrient loads and stormwater runoff. Monitor the increasing conductivity and chloride trends as chloride can negatively impact drinking water and aquatic life. Continue efforts to monitor water quality in spring, fall and winter to better understand nutrient dynamics and effects on cyanobacteria growth. Keep up the great work!

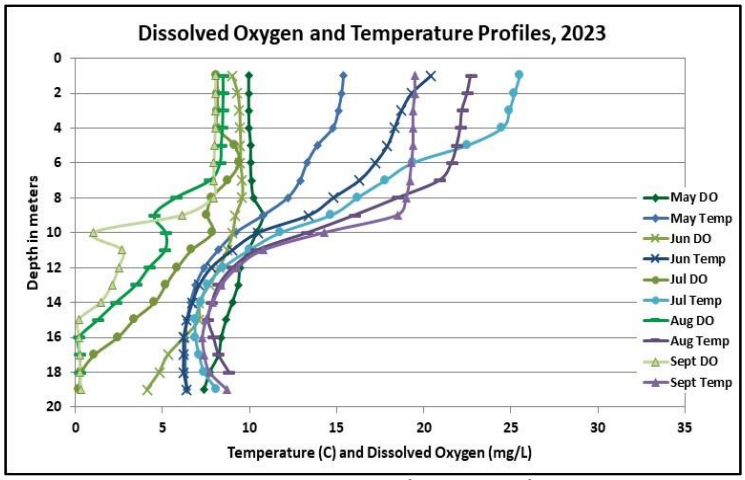
HISTORICAL WATER QUALITY TREND ANALYSIS

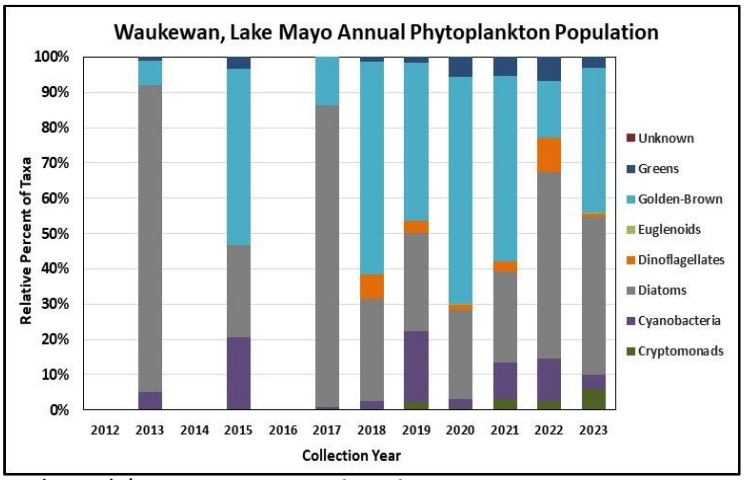
PARAMETER	TREND	PARAMETER	TREND
Conductivity	Worsening	**Chlorophyll-a**	Stable
pH (epilimnion)	Stable	**Transparency**	Improving
Phosphorus (hypolimnion)	Stable	**Phosphorus (epilimnion)**	Stable

HISTORICAL WATER QUALITY GRAPHICS









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

- **CHLOROPHYLL-A:** Chlorophyll level was low in May, decreased in June, increased in July, increased to an elevated level in August, and decreased to a low level in September. Average chlorophyll level increased from 2022 but remained less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates relatively stable chlorophyll levels since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Deep Spot, Inlet, Outlet, Perkins Cove, Sayward Bk., Sayward Bk. at Rock Ridge, and Sayward Bk. Upper conductivity and chloride levels remained slightly elevated and greater than the state medians. Historical trend analysis indicates significantly increasing (worsening) epilimnetic conductivity levels since monitoring began. Camp Rd. Trib., EE Brook and Mayo Farm Brook conductivity and chloride levels were within a low range.
- **COLOR:** Apparent color measured in the epilimnion indicates the water was clear with little to no tea, or brown, coloring.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus level was slightly elevated in May, decreased to a low level through August, and then increased slightly in September. Average epilimnetic phosphorus level increased from 2022, was less than the state median, and was approximately equal to the threshold for oligotrophic lakes. Metalimnetic phosphorus level fluctuated within a low range. Hypolimnetic phosphorus level was stable and low through August and increased to an elevated level in September. Historical trend analysis indicates relatively stable epilimnetic and hypolimnetic phosphorus levels since monitoring began. EE Brook, Inlet, Mayo Farm Bk., Outlet, and Perkins Cove phosphorus levels were low. Camp Rd. Trib., Sayward Bk. Rock Ridge and Upper phosphorus levels were within a moderate range. Sayward Bk. phosphorus level was slightly elevated.
- **TRANSPARENCY:** Transparency measured with (VS) and without (NVS) the viewscope was high (good) in May, decreased (worsened) in June following significant rainfall, increased (improved) in July, decreased in August due to wave conditions, and remained stable in September. Average NVS transparency decreased from 2022 but remained higher (better) than the state median. Historical trend analysis indicates significantly increasing (improving) NVS transparency since monitoring began.
- **TURBIDITY:** Epilimnetic, Metalimnetic and Hypolimnetic turbidity levels were low through August and then increased to a slightly elevated level in September. Turbidity levels were low at all tributaries except Camp Rd. Trib where it was elevated.
- **PH:** Epilimnetic, Metalimnetic and tributary pH levels were within the desirable range of 6.5-8.0 units. Historical trend analysis indicates stable, yet variable, epilimnetic pH levels. Hypolimnetic pH level was slightly acidic and less than desirable.

Table 1. 2023 Average Water Quality Data for LAKE WAUKEWAN, MAYO - MEREDITH

Station Name	Alk. (mg/L)	Chlor-a (ug/L)	Chloride (mg/L)	Color (pcu)	Cond. (us/cm)	Total P (ug/L)	Trans. (m)		Turb. (ntu)	pH
							NVS	VS		
Epilimnion	8.7	2.81	28	16	141.5	8	6.57	6.69	0.49	7.11
Metalimnion	-	-	-	-	144.1	8	-	-	0.60	6.88
Hypolimnion	-	-	30	-	146.7	12	-	-	0.89	6.39
Camp Rd. Trib.	-	-	4	-	33.3	14	-	-	3.51	6.54
EE Brook	-	-	2	-	33.1	2	-	-	0.08	6.56
Inlet	-	-	25	-	120.7	8	-	-	0.59	6.76
Mayo Farm Bk.	-	-	5	-	40.2	7	-	-	0.24	6.60
Outlet	-	-	31	-	146.0	8	-	-	0.63	6.99
Perkins Cove	-	-	30	-	146.7	7	-	-	0.51	6.97
Sayward Bk.	-	-	30	-	130.2	18	-	-	0.54	6.71
Sayward Bk. Rock Ridge	-	-	26	-	126.8	13	-	-	0.78	6.74
Sayward Bk. Upper	-	-	14	-	81.2	13	-	-	0.60	6.52

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 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)