



# VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS

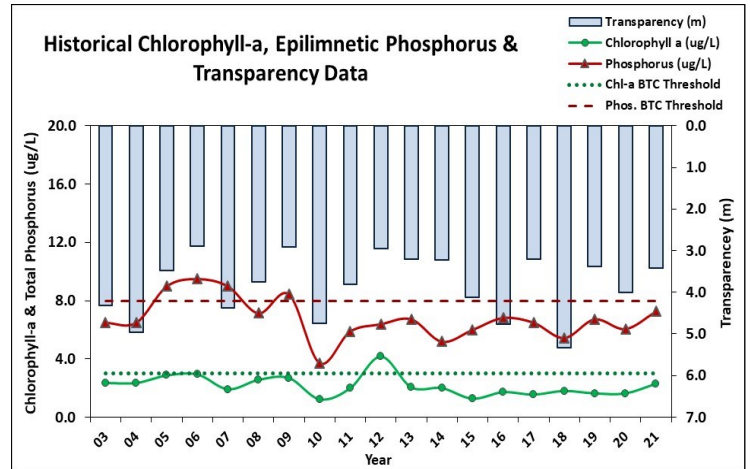
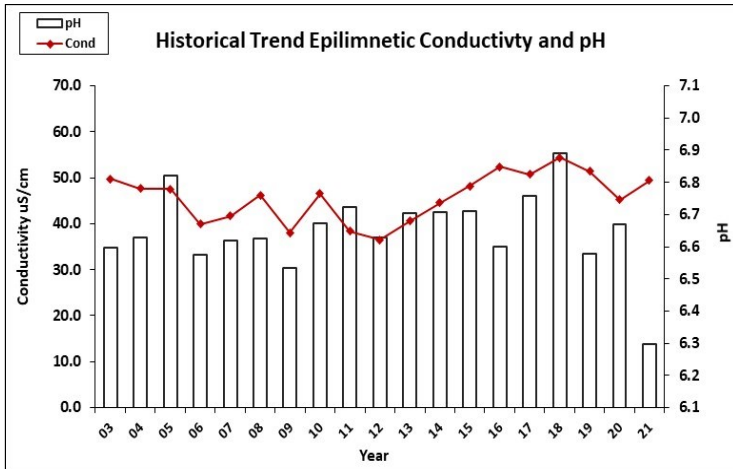
## BERRY BAY, FREEDOM

### 2021 DATA SUMMARY

**RECOMMENDED ACTIONS:** Great job sampling in 2021! Nutrient (phosphorus) and chlorophyll levels have stabilized below the thresholds for oligotrophic lakes which is a positive sign. However, phytoplankton monitoring reveals cyanobacteria are becoming more dominant in the Bay. The increased frequency and intensity of significant storm events, as experienced in 2021, combined with warmer water temperatures, longer growing seasons due to earlier ice out and later ice in, and potential internal load of nutrients from bottom sediments under anoxic conditions highlights the importance of targeted watershed management efforts aimed at reducing nutrient loading from the watershed. Observe the lake for any signs of cyanobacteria in late summer/fall and notify NHDES' [Harmful Algal Bloom Program](#) if observed. Continue efforts to implement the watershed management plan and reduce stormwater runoff and erosion throughout the watershed. Encourage shoreline property owners to be certified [LakeSmart](#) through NH LAKES lake-friendly living program. Continue watershed education and outreach efforts to maintain the health of the Ossipee Lake System. Keep up the great work!

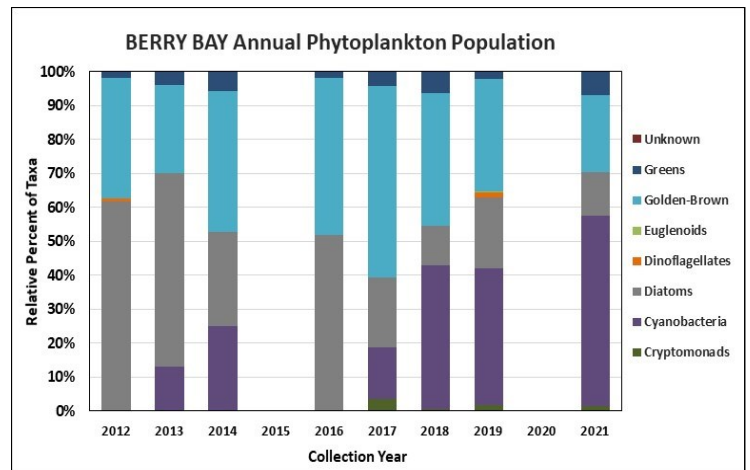
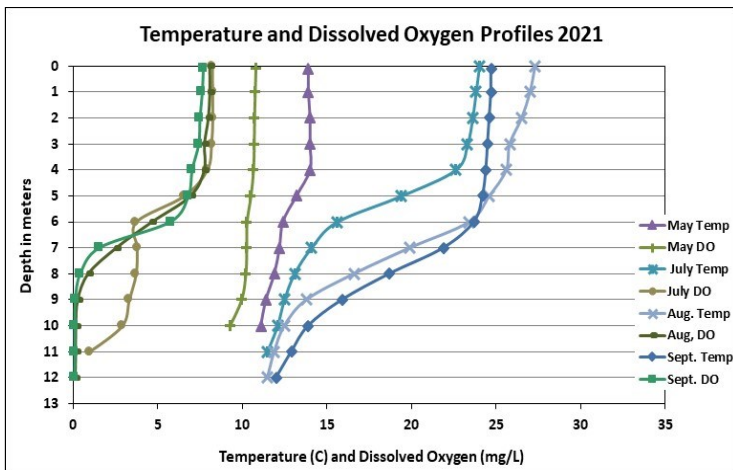
### HISTORICAL WATER QUALITY TREND ANALYSIS

| 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 May, decreased through August, and then increased slightly in September but remained low. Average chlorophyll level increased slightly from 2020 and was less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates relatively stable chlorophyll levels since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Epilimnetic (upper water layer), Metalimnetic (middle water layer) and Hypolimnetic (lower water layer) conductivity and chloride levels were slightly greater than the state medians, yet less than a level of concern. Historical trend analysis indicates stable epilimnetic conductivity levels since monitoring began.
- **COLOR:** Epilimnetic color data indicate the water was borderline light to moderately tea colored, or light brown to brown, and was darkest in May, August and September following spring snowmelt and significant summer rainfall.
- **TOTAL PHOSPHORUS:** Epilimnetic phosphorus level was slightly elevated in May, decreased to a low level in June and July, increased again in August, and then decreased in September. Average epilimnetic phosphorus level increased slightly from 2020 and was slightly less than the state median and the threshold for oligotrophic lakes. Historical trend analysis indicates stable epilimnetic phosphorus levels since monitoring began. Metalimnetic phosphorus level was slightly elevated in July and August following significant rainfall amounts. Hypolimnetic phosphorus level fluctuated within a slightly elevated range and was highest in May.
- **TRANSPARENCY:** Transparency measured without the viewscope (NVS) was within an average range in May, increased (improved) in June, decreased (worsened) slightly in July, and then increased through September. Average NVS transparency decreased slightly from 2020 and was slightly higher (better) than the state median. Historical trend analysis indicates stable, yet variable, NVS transparency since monitoring began. Viewscope transparency (VS) was higher than NVS transparency and likely a better measure of actual conditions.
- **TURBIDITY:** Epilimnetic turbidity levels fluctuated within a low range. Metalimnetic turbidity level was slightly elevated in July. Hypolimnetic turbidity level was slightly elevated in May and elevated in August and September under anoxic (low dissolved oxygen) conditions.
- **pH:** Epilimnetic pH level fluctuated above and below the low end of the desirable range 6.5-8.0 units and average pH was slightly less than desirable. Historical trend analysis indicates stable epilimnetic pH levels since monitoring began. Metalimnetic and Hypolimnetic pH levels were slightly acidic and less than desirable.

| Station Name | Table 1. 2021 Average Water Quality Data for BERRY BAY - FREEDOM |                   |                    |                |                  |                   |            |      |                |      |
|--------------|--|-------------------|--------------------|----------------|------------------|-------------------|------------|------|----------------|------|
|              | Alk.<br>(mg/L)   | Chlor-a<br>(ug/L) | Chloride<br>(mg/L) | Color<br>(pcu) | Cond.<br>(us/cm) | Total P<br>(ug/L) | Trans. (m) |      | Turb.<br>(ntu) | pH   |
|              |  |                   |                    |                |                  |                   | NVS        | VS   |                |      |
| Epilimnion   | 5.6  | 2.29              | 10                 | 44             | 49.5             | 7                 | 3.41       | 3.90 | 0.54           | 6.30 |
| Metalimnion  |  |                   |                    |                | 49.0             | 9                 |            |      | 1.02           | 6.14 |
| Hypolimnion  |  |                   |                    |                | 51.8             | 11                |            |      | 3.93           | 6.04 |

#### 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)