

BOW LAKE

2021 SAMPLING HIGHLIGHTS

Near-shore sampling locations

Strafford and Northwood, NH



Water quality data displayed in Table 1, and Figures 2 and 3, are surface water measurements that were collected at a fixed depth of 0.5 meters (approximately 1.5 feet). Deep reference site results from sites 1 Ledges and 3 Bennett are also displayed to provide some insight into variations among the nearshore and deep open water locations. The nearshore sampling locations are intended to provide an overall assessment of general water quality variations around the periphery of Bow Lake. Stand-alone Ledges and Bennett highlight reports provide greater detail on the overall Bow Lake water quality while this report highlights notable differences among the near-shore sampling sites.

2021 Nearshore Sampling Highlights

Near-shore total phosphorus concentrations varied among the 24 sampling locations, and among dates, during the 2021 sampling season (Figures 1 – 2). Most nearshore total phosphorus concentrations remained below the 10 micrograms per liter threshold that is considered sufficient to stimulate short-term algal blooms (Figures 1 and 2). The 2021 near-shore total phosphorus concentrations were generally higher in the more embayed near-shore Kooaukee Island (S-40 and S-35), Site S-001 and Skier Cove (S-090) where the total phosphorus concentrations commonly exceed 10 micrograms per liter. On the other hand, the least embayed sites, such as S-25A, S-60 and S-70 (Figure 3), exhibited some of the lower total phosphorus concentrations documented among the near-shore sampling locations and were among the lower phosphorus concentrations documented during the 2021 sampling season. Future sampling should continue to emphasize monthly sampling at each sampling location that will better assess the variability among sites and that will continue to screen for potential problem areas around Bow Lake. Early season samples, collected in April/early May, are also encouraged to help characterize the Bow Lake nutrient concentrations that are associated with the heavy spring runoff/snowmelt period. Key take aways include:

- The more embayed near-shore sampling locations tended to exhibit elevated total phosphorus concentrations and may be more susceptible to future nutrient loading and resulting algal/cyanobacteria blooms.
- The least embayed near-shore sampling locations are more similar to the deep-open water reference sampling locations.
- Future stormwater management mitigation projects can be implemented to stabilize and improve the Bow Lake water quality (see recommendations section for pertinent on-line resources).

Figure 1. Bow Lake Nearshore Total Phosphorus Inter-comparison (2021)

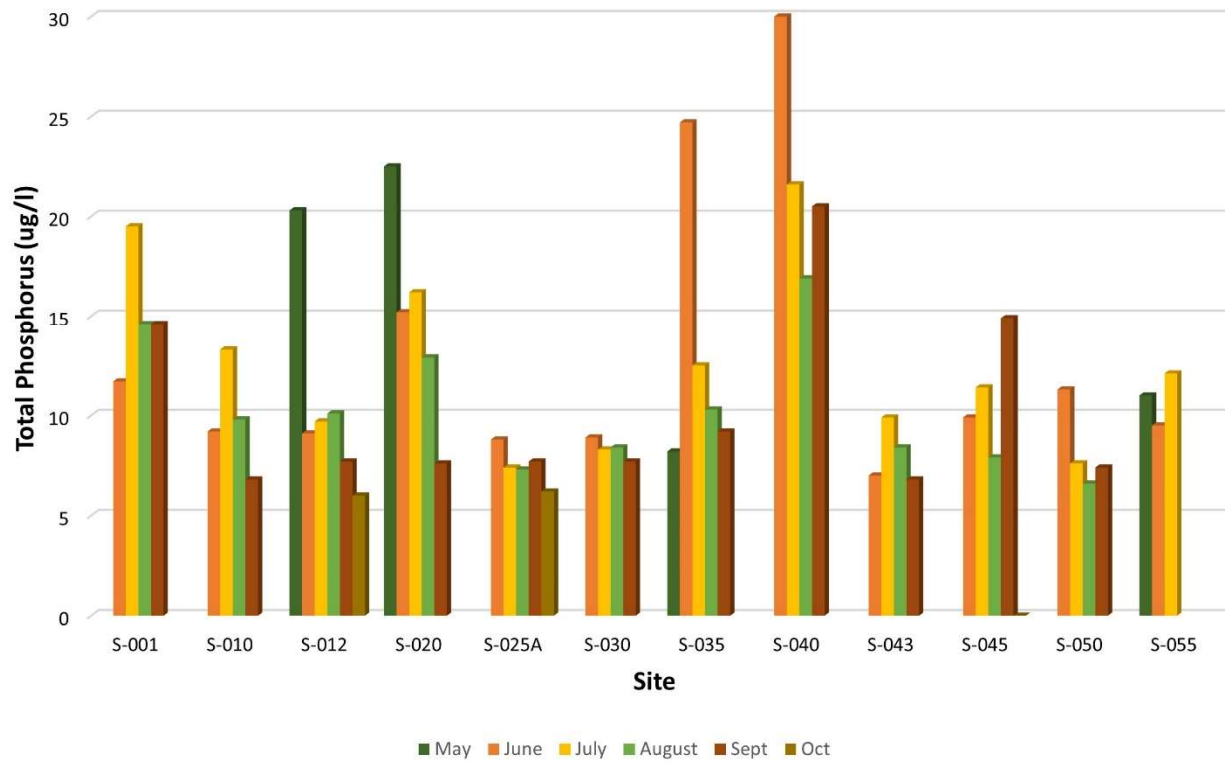


Figure 2. Bow Lake Nearshore Total Phosphorus Inter-comparison (2021)

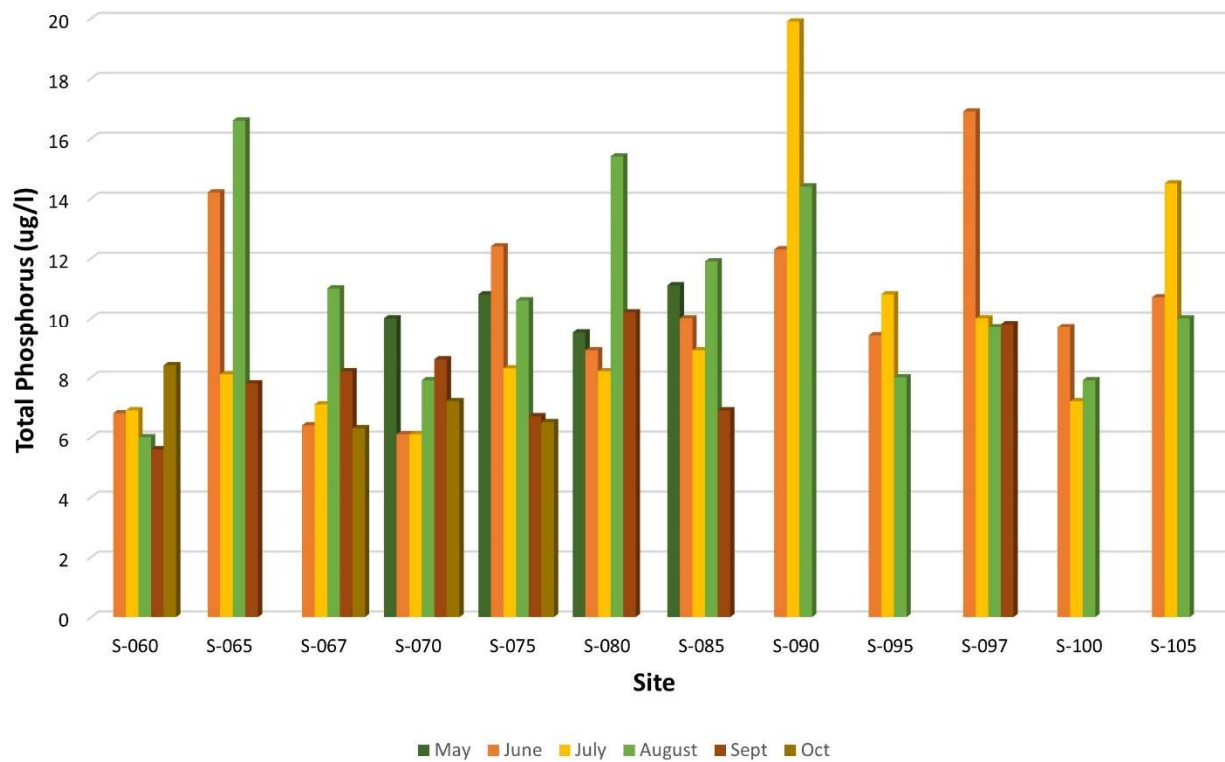


Table 1. 2021 Bow Lake Seasonal Average Total Phosphorus Concentrations and NH DES Aquatic Life Nutrient Criteria¹ Evaluated by sampling location

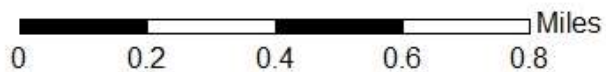
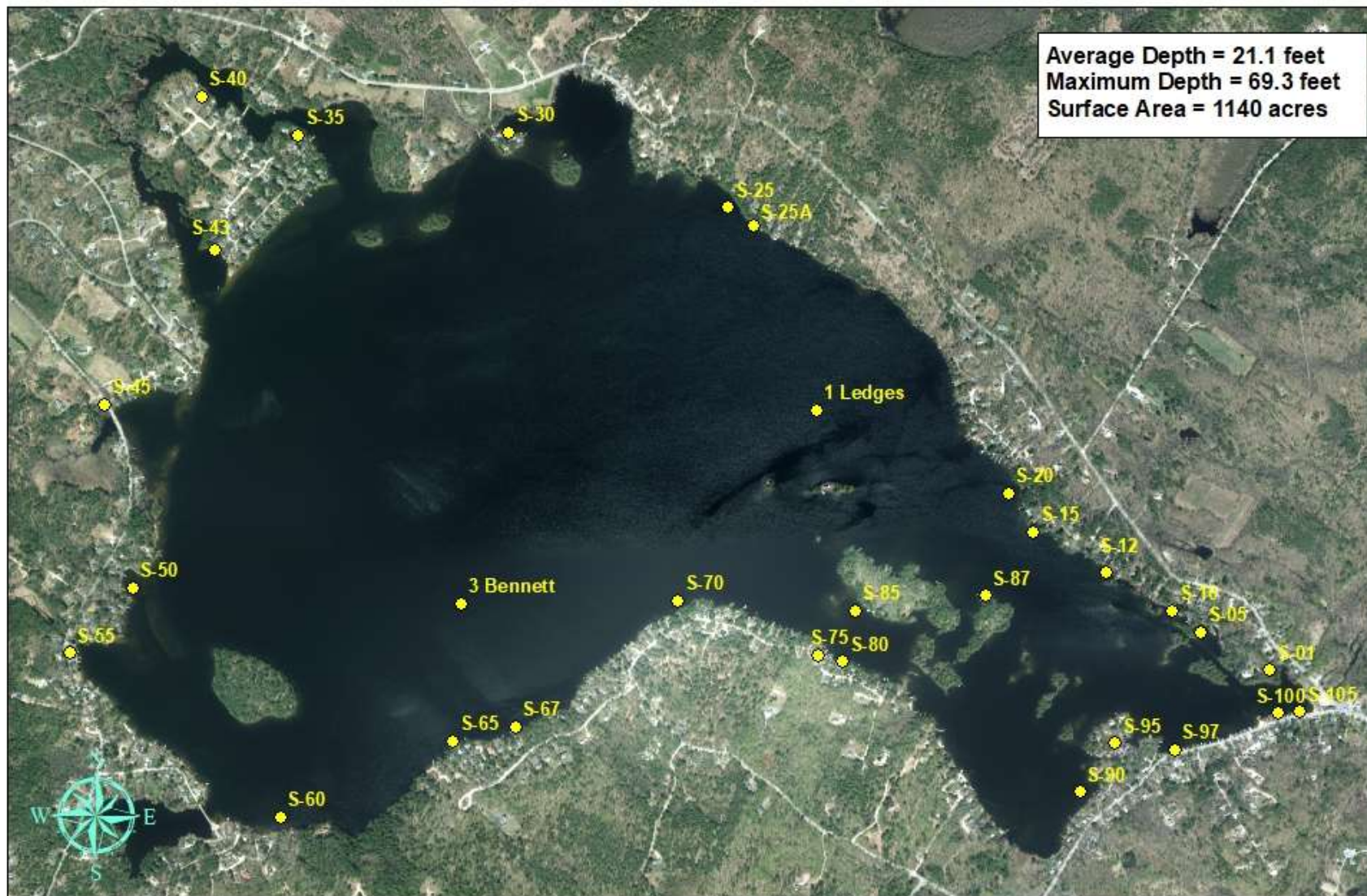
Oligotrophic "Excellent"	Mesotrophic "Fair"	Eutrophic "phosphorus enriched"	Sampling Station	Total Phosphorus Average (range) (ppb)	Classification
< 8.0 parts per billion (ppb)	> 8.0 – 12.0 parts per billion (ppb)	> 12.0 – 28.0 parts per billion (ppb)	1 Ledges	7.0 ppb (5.3 – 8.0)	Oligotrophic
			3 Bennett	7.3 ppb (5.9 – 8.8)	Oligotrophic
			S-01	15.1 ppb (11.7 – 19.5)	Eutrophic
			S-10	9.8 ppb (6.8 – 13.3)	Mesotrophic
			S-12	10.5 ppb (6.0 – 20.3)	Mesotrophic
			S-20	14.9 ppb (7.6 – 22.5)	Eutrophic
			S-25A	7.5 ppb (6.2 – 8.8)	Oligotrophic
			S-30	8.3 ppb (7.7 – 8.9)	Mesotrophic
			S-35	13.0 ppb (8.2 – 24.7)	Eutrophic
			S-40	46.2 ppb (16.9 – 125.7)	Eutrophic
			S-43	8.0 ppb (6.8 – 9.9)	Mesotrophic
			S-45	11.0 ppb (7.9 – 14.9)	Mesotrophic
			S-50	8.2 ppb (6.6 – 11.3)	Mesotrophic
			S-55	10.9 ppb (9.5 – 12.1)	Mesotrophic
			S-60	6.3 ppb (5.6 – 6.9)	Oligotrophic
			S-65	11.7 ppb (7.8 – 14.2)	Mesotrophic
			S-67	8.2 ppb (6.4 – 11.0)	Mesotrophic
			S-70	7.7 ppb (6.1 – 10.0)	Oligotrophic
			S-75	9.8 ppb (6.7 -12.4)	Mesotrophic
			S-80	9.8 ppb (6.6 – 15.4)	Mesotrophic
S-85	9.1 ppb (5.7 – 11.9)	Mesotrophic			
S-90	15.6 ppb (12.3 – 19.9)	Eutrophic			
S-95	9.4 ppb (8.0 – 10.8)	Mesotrophic			
S-97	11.6 ppb (9.7 – 16.9)	Mesotrophic			
S-100	8.3 ppb (7.2 – 9.7)	Mesotrophic			
S-105	11.7 ppb (10.0 – 14.5)	Mesotrophic			

Recommendations

Implement Best Management Practices within the Bow Lake watershed to minimize the adverse impacts of polluted runoff and erosion into Bow Lake. 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.

- https://extension.unh.edu/resources/files/resource004159_rep5940.pdf
- <https://www.des.nh.gov/sites/g/files/ehbemt341/files/documents/2020-01/homeowner-guide-stormwater.pdf>

Figure 3. Bow Lake
Strafford & Northwood, NH
2021 deep water and nearshore sampling sites



Aerial Orthophoto Source: NH GRANIT
Site location GPS coordinates collected by the UNH Center for Freshwater Biology



Extension

