

Julia Sese, Fordham University. Harmful algal blooms and nutrient additions. Mentors: Dr. John Wehr and Michael Kausch

Abstract: Cyanobacteria blooms are a globally recognized water quality crisis that causes detrimental environmental and public health issues. In order to study how to control these harmful algal blooms, we conducted a 4 by 2 factorial experiment to observe the effects of adding nitrogen (N) in different forms (NH_4^+ , NO_3^- , $\text{NO}_3^- + \text{NH}_4^+$, urea) and concentrations to Calder Lake water. We analyzed samples collected for chl-*a* concentration, particulate CNP, dissolved nutrients, and species composition. Comparing the treatments with neither N nor P added with the treatments of only P added we found no significance (t-value= 0.292, $p=0.601$), indicating that nitrogen is the main factor contributing to algal blooms in Calder Lake. We also found that in both high and low N concentration treatments, nitrate had the highest chl-*a* concentration ($\mu\text{g/L}$) and ammonium had the lowest concentration, opposing our initial predictions that ammonium would produce the highest algal biomass. Overall, every N treatment showed a significant difference ($p < 0.005$) in chl-*a* from a low concentration of N to a high concentration of N. Based on our results, nitrogen is an important bloom-forming factor that should be further investigated to manage eutrophication.