

Small Pond Water Chemistry and Algal Ecology: A Study of Two Eutrophic Bodies

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Abstract:

Anthropogenic contamination of water bodies with excess nutrients and road salts has resulted in cultural eutrophication and freshwater salinization throughout the Midwestern and Eastern United States. This study focuses on the algal populations and chemical properties of two small, manmade water bodies; Gilmore Pond in Westborough, MA, and Peacock Pond in Norton, MA. Over the course of six months (late May-early November), environmental parameters including nutrients, ions, as well as temperature, dissolved oxygen, conductivity, and pH were measured to determine effects on pond trophic status and algal populations. Gilmore Pond was determined to be a eutrophic system, dominated by phytoplankton, with brown waters, likely resulting from terrestrial dissolved organic carbon inputs. Peacock Pond was determined to be a eutrophic system, dominated by benthic algae, with high salt contamination from surrounding roads and walkways. Additionally, a field study of the dinoflagellate *Cirratium hirundinella* in Peacock Pond revealed morphological changes with fluctuations in water temperature and phosphorus. Using past data on algal bioindicators and environmental parameters, a decline in water quality was observed in both water bodies between a similar survey in 2013 and the present study. The results of this study will be used by future student researchers and pond managers as we attempt to improve the aesthetic and ecological properties of these ponds.