

Title: Assessment of floating gardens to improve the water quality of the Chicago River

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Increased inputs from urban runoff have degraded the water quality of urban streams, causing detrimental impact to the environment. Surrounding the Chicago River specifically, over 80% of land use is urban, and the river's chemical state has become impaired over time. As a solution, a local non-profit, Urban Rivers, has installed artificial floating wetland habitat, a novel best management practice, along a small, 3x50 m stretch of the river with the intention of adding aquatic habitat, in order to improve the health of the river. This study answered the question of whether a floating garden provides localized remediation in a stream, specifically through nutrient and chloride removal in stream. Water from the Chicago River was sampled upstream and downstream of the floating garden at the surface and at 0.3 m depth over time and analyzed to determine if the garden had an impact on the river's water chemistry. The measured mean concentration of nitrate as nitrogen revealed a decrease in concentration downstream of the floating gardens. Chloride did not decrease downstream, but chloride is not a key nutrient for most plants like the other measured compounds in this study, which may explain this result. Additionally, sulfate decreased at surface and depth downstream of the floating gardens. Phosphate decreased at surface downstream, but at 0.3 m depth, phosphate was more variable downstream, which could be due to increased mixing with the deeper river water at the bottom of the floating garden. The studied sections of floating gardens cover only about 200 m² of river, but these results show that with more extensive application, floating gardens have the potential to improve water quality in streams. The floating gardens at the Chicago River decrease excess levels of certain chemicals in stream and could increase water quality in urban streams with broader implementation.