

MN FUTURES RESEARCH GRANT 2022-2024

Project Title: Lead bioavailability and ecological remediation across the Twin Cities

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Lead pollution in soil and water is of significant concern in many urban and residential areas of Minnesota; such contaminant exposure often disproportionately affects communities of color and lower economic status. This research has three primary goals to reduce the negative impacts of lead in Minnesota. First, we will expand on our current knowledge of lead across the Twin Cities by quantifying lead chemistry and bioavailability across green spaces, gardens, and stormwater ponds. We test predictions relating soil properties and management of green infrastructure to lead immobilization and risk to humans and wildlife. Second, we will develop and test methods that use iron- and manganese-oxide coated cellulose fibers to bind and immobilize lead from stormwater settling ponds. Third, we will experiment with bioremediation of lead through plantings in lead-contaminated soils, piloting the use of metal-accumulating species that are fast growing and cold tolerant. This research will pave the way for external grants and provide key guidance for cities, watershed management organizations, and individuals for selection of the best management practices to mitigate the impacts of lead pollution. Regular interactions and collaborations with community-based groups and agency stakeholders will increase the impact of the work on urban ecosystems and human health.