THE NITROGEN CONTENT AND ISOTOPIC COMPOSITION OF URBAN AND RIPARIAN SOILS

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Natural ecosystems are increasingly converted into urban areas. This conversion has many impacts on the nitrogen (N) cycle, including increased N inputs in the form of fertilizer. In this study, we compared N content and isotopic composition of soils from cultivated urban lawns on the University of Utah campus, with soils of a nearby riparian forest. The goal of this study was to better understand how urbanization affects the N cycle. We compared %N of riparian and lawn soils using a Wilcoxon signed-rank test. C:N ratios and isotopic composition (δ¹⁵N) were compared using a Student’s t-test.

We hypothesized that the lawn soils would have higher %N than the riparian soils as a result of increased N inputs via fertilizer. However, riparian soils had slightly higher %N than lawn soils (W=170, p = 0.049). This could be due to rapid N assimilation of fertilizer by lawns. Interestingly, the riparian soils had a higher C:N ratio (t = 9.522, p = 0.001), indicating that riparian soils are more N limited than the lawn soils. As we expected, riparian soils were more enriched in δ¹⁵N than the lawn soils (t = 3.107, p = 0.004). This enrichment is a potential indicator of increased microbial activity and other fractionation processes in riparian soils. These results suggest that N cycling in lawn soils is distinguished from natural riparian soils. This distinction is the result of lawn fertilization.