SOIL DENITRIFICATION DYNAMICS IN URBAN IMPACTED RIPARIAN ZONES THROUGHOUT TAMPA, FL

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Denitrification is the anaerobic, microbial transformation of nitrate (NO_3^-) into inert, atmospheric nitrogen (N) under ideal conditions. It is a critical process in the management of anthropogenic NO_3^- and has been shown to respond to elevated N concentrations within the soil of urban riparian zones. We investigated the relationship between land use / land cover (LULC)classifications on soil denitrification and associated biogeochemistry within coastal, sub-tropical riparian zones. Soil samples were collected from low-order streams throughout Tampa, FL at distances of 0 m, 5 m, and 10 m from the streambank. Results from factorial analysis indicate that LULC classification ($p = 0.005$, $F = 4.406$) was significant in predicting denitrification enzyme activity (DEA) potential, with high density residential sites showing the greatest average DEA potential at 2.439 mg N $kg^{-1}h^{-1}$. Variables showing significant difference based on LULC classifications were pH and soil carbon to N ratio and showing that these factors likely had the most influence over riparian zone soil DEA potential based on LULC classification. These findings suggest that urban riparian zones are responding to elevated soil nitrogen; however, high residential areas showed lower carbon to nitrogen ratios than other sites, suggesting that some of the most urbanized areas could be improved to act as better NO_3^- sinks.

PRESENTER BIO: Dr. Roberts is a commercial horticulture agent and educator for UF-IFAS Palm Beach County Extension. He has worked on various research and educational projects related to urban forestry, ecosystem services, and landscape management.