Geomorphic Controls of Denitrification in Riparian Wetland Soils: II. Vertical Patterns of Groundwater Denitrification. (S10-kellogg150715-Poster)

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Abstract:

Riparian zones demonstrate wide variation in groundwater nitrate removal. Geomorphic setting may provide insights into the variability in riparian groundwater nitrate removal and thus enhance watershed-scale estimates of riparian denitrification capacity. We studied in situ groundwater denitrification rates (65 cm, 150 cm and 300 cm depth) in hydric riparian soils of glacial outwash and alluvial settings. We expected hydric soils in glacial outwash settings to exhibit a sharp decline in organic matter with depth and alluvial soils to exhibit layers of organically enriched deposits deeper below the soil surface as the result of flooding events. Since groundwater denitrification generally requires carbon as an energy source, we hypothesized that groundwater denitrification rates would decline abruptly with depth in glacial outwash settings but remain fairly constant throughout the soil profile in alluvial settings. However, based on results from two years of field monitoring we found considerable variation in the magnitude and vertical extent of groundwater denitrification rates within and between glacial outwash and alluvial riparian settings.

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