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NUTRIENT SPECIFIC FLOW PATHS DURING STORM EVENTS IN A MIDWESTERN WATERSHED

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Exports of nitrate, soluble reactive phosphorus (SRP), and dissolved organic carbon (DOC) from Midwestern states have been identified as causes of many water quality problems both locally and nationally (e.g., eutrophication and Hypoxia in the Gulf of Mexico). Therefore, understanding these nutrient export processes in Midwestern watersheds is critical to mitigating both local and national water quality concerns. The objective of this study is to determine variations in nitrate, SRP, and DOC concentration in an agriculturally dominated and a residential-dominated first order watershed during spring and summer storm events and to identify nutrient specific export pathways. We hypothesized that each watershed will exhibit different nitrate, SRP, and DOC peaks along the storm hydrograph, indicating different flowpaths. Stream discharge was monitored continuously, while precipitation, groundwater, and tile water samples were analyzed before and after each storm for inorganic nitrogen, SRP, DOC, major cations, and 18-O. Stream water samples were also collected during four storm events during the wet and dry season using automated samplers. Two independent techniques were used to determine nutrient specific flow paths: the 18-O method and the major cation method. Identifying changes in water sources during events using two independent approaches in relation to nutrient export patterns allows for a better characterization of nutrient export processes in the two watersheds. This work will aid in the development of nutrient export models for agricultural and developing areas of the Midwest.

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