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**Nitrogen, phosphorus and carbon losses dynamics monitoring across scale in Midwestern streams: a research proposal: a research proposal**

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Characterizing losses of nitrogen, phosphorus and carbon (NPC) to streams during storms is critical to understanding processes affecting water quality. However, little research has been conducted on NPC dynamics during storms in Midwestern streams across a range of scale. This project investigates nitrate, ammonium, total nitrogen, soluble reactive phosphorus, total phosphorus, total organic carbon and dissolved organic carbon concentrations in streams during high flow periods in Eagle Creek (274 km<sup>2</sup>) and the White River (2220 km<sup>2</sup>) watersheds in Central Indiana, USA. Water samples will be collected using an automated sampler during 4 to 6 storms in 2007 on the rising and falling limbs of the hydrograph in both streams to capture NPC dynamics during high flow periods. Stream discharge and precipitation will be monitored continuously, and stream and precipitation samples will be analyzed for oxygen-18 and major cations to characterize stream hydrology and the relative contribution of event and pre-event water to storm flow. It is hypothesized that NPC concentration peaks in the White River will be more sluggish than in Eagle Creek, and that scale and network complexity will play a critical role in determining NPC concentration patterns in each watershed. This study will bring insight into the role of scale and stream network complexity at controlling NPC dynamics in streams, and help develop better estimates of NPC fluxes in streams during high flow periods, which is a critical step toward achieving water quality goals in the 21st Century.