

## **ABSTRACT**

**THESIS:** Water Quality Assessment of Prairie Creek Tributaries in Delaware County, Indiana

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**Date:** July 2015

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Prairie Creek Reservoir was located in east-central Indiana within an agricultural watershed. The reservoir served as a secondary source of drinking water for the city of Muncie and provided various recreational amenities. Previous research had focused on water quality in the reservoir, and land management decisions were performed based on those studies. The current study was conducted to obtain baseline physical and chemical data on the five major tributaries of Prairie Creek Reservoir, and to determine how agricultural land use impacted water quality via tributary sub-watersheds. Water temperature, dissolved oxygen and pH were measured over the course of 133 days; additionally, concentrations of nitrate, ammonium, and phosphorus species were analyzed. Discharge was measured using a Flowtracker®. Dissolved oxygen concentrations were below Indiana Administrative Code (IAC) guidelines; total phosphorus and particulate phosphorus significantly differed between several tributaries; whereas total nitrogen and nitrate concentrations did not significantly differ, which indicated consistent nitrogen concentrations throughout the watershed. Shave Tail Creek produced the largest nutrient load per  $\text{kg}/\text{km}^2/\text{yr}$ .; nevertheless, Carmichael Ditch was ranked the worst tributary among the other sampling

locations in terms of overall water quality. Best management practices should be implemented at Carmichael Ditch and Shave Tail Creek to sustain reservoir water quality.