

Determining Nutrient Contribution on a Subwatershed Scale:

Eagle Creek Watershed, Central Indiana

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Subwatershed nutrient and sediment contributions were determined for an urban eutrophic reservoir in central Indiana. Eagle Creek Reservoir is located 10 miles northwest of Indianapolis and serves as a primary source of drinking water to the city. Algal blooms during the summer months are common and can add extra stress on the water treatment plant due to the associated water quality issues and nuisance taste and odor compounds. The watershed surrounding Eagle Creek Reservoir consists of ten subwatersheds totaling 162 square miles (419.7 km²) and is dominated by agricultural landuse with some portions rapidly urbanizing. Goals of ongoing research in Eagle Creek watershed include determining the role of subwatershed inputs to the water quality of the reservoir and identifying the sources of contaminants within the watershed.

Nutrient contributions were measured for the subwatersheds of Eagle Creek to determine problematic areas and those in critical need of attention. Samples were collected throughout the watershed during base flow and event flow (runoff) quarterly in 2003 and biweekly at inflow points to the reservoir during 2004. Sample analyses included total suspended sediment, total nitrogen, total phosphorus, and E. coli. Sample sites were selected relative to subwatershed boundaries. Loadings were calculated for select stream segments and evaluated relative to land use and land use changes, point sources, areas with septic systems, and confined animal feeding operations. The most important factors influencing watershed contributions include: season (wet vs. dry), land use and land use change, and slope. Subwatersheds undergoing conversion from agricultural landuse to suburban are experiencing increased sediment and nutrient loads that are disproportionate to their subwatershed areas.