

MEASURING AND MODELING SUSPENDED SEDIMENT AND NUTRIENT
YIELDS IN A MIXED-LAND USE WATERSHED OF THE CENTRAL UNITED
STATES

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ABSTRACT

Science-based information is needed to better understand mixed-land-use contributions of suspended sediment and nutrient loads to receiving water bodies. Water samples were analyzed for suspended sediments and nutrients using a nested-scale experimental watershed study design ($n=836$ samples \times 5 gauging sites) in an urbanizing mixed-land use watershed of the central USA. Highly variable annual precipitation was observed during the four year study period (2010-2013) with the greatest suspended sediment and nutrient yields during 2010 (record setting wet year) and least yields during 2012 (extreme drought year). Estimated annual suspended sediment yields ranged from $16.1 \text{ t km}^{-2} \text{ yr}^{-1}$ during 2012 to $313.0 \text{ t km}^{-2} \text{ yr}^{-1}$ during 2010. Annual total inorganic nitrogen and total phosphorus yields exceeded 10.3 and $2.04 \text{ kg ha}^{-1} \text{ yr}^{-1}$ from the agricultural dominated headwaters. Multiple linear regression analyses indicated significant ($CI = 0.05$) relationships between pollutant loading, annual total precipitation (positive correlate), urban land use (positive correlate), forested land use (negative correlate), and wetland land use (negative correlate). Results highlight the need for ongoing studies, and improved best management practices designed to reduce suspended sediment and nutrient loading in mixed-land use watersheds globally.