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Towards Sustainable Water Resources for Mixed Agricultural and Urban Watersheds

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As watersheds continue to undergo transformation to mixed agricultural and urban land use, new challenges face water resource managers working to improve water quality and quantity. Improving water resources in the glaciated Midwest region hinges on integrated approaches addressing not only water quality, but water use, wastewater treatment, and the physical environment. Historically, research and management activities have worked independently to address water resource issues and agricultural and storm water issues have been treated separately. The myriad of agencies and institutions conducting research and responsible for watershed management plan development and implementation has hampered efforts to improve water resources. In what can be described as the tragedy of many small decisions, water resource quality and quantity are again in a state of decline after nearly three decades of improvement. Critical to a reversal in the trend of degradation is consideration of the fundamentals of the hydrologic cycle and approaches that consider restoration of the entire cycle including essential ecological and social functions. This paper will discuss challenges associated with water resources in mixed agricultural and urban watersheds and the need for integrated stream and wetland restoration within a landscape and land use setting. We will also highlight the cumulative effects of wholesale shifts in water resource utilization, artificial flow pathway propagation and the resultant landscape responses. Opportunities for water reuse and integrated water resource management will be presented.