Dissecting the Drivers of Water-Quality Response in Urban and Agricultural Watersheds

presented by James S. Webber, Hydrologist
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Presenter Biography:
James Webber serves as a Hydrologist for the U.S. Geological Survey, Virginia and West Virginia Water Science Center. He holds a M.S. in Forest Resources from the Pennsylvania State University. He is primarily involved in multiple nutrient and sediment transport studies in the Chesapeake Bay watershed. His research interests include understanding the fate and transport of surface water contaminants through coupled monitoring and modeling activities.

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https://wvu.zoom.us/j/93674747548

Abstract: Management practices designed to reduce nitrogen and phosphorus in rivers and streams are being used throughout the Chesapeake Bay watershed to improve local water-quality conditions and meet regulatory mandates. The effectiveness of such practices has been demonstrated in many field- and plot-scale studies, but expected benefits are not always apparent over multiple years at watershed-scale. In 2010, the US Geological Survey partnered with the US Environmental Protection Agency and the US Department of Agriculture to initiate water-quality monitoring in four watersheds that were targeted for increased implementation of management practices. These data are being used to better understand the factors that affect nitrogen and phosphorus changes in agricultural and urban streams. This presentation will highlight how insights into nutrient sources and transport can inform watershed management. Manure is an important source of nitrogen in Smith Creek, an agricultural watershed in Virginia's Shenandoah Valley. Because of the watershed's karst geology, nitrogen can enter groundwater quickly but reach streams slowly, sometimes over multiple years. There are many sources of nitrogen in Difficult Run, a suburban watershed in Northern Virginia, including contributions of septic system effluent. Nitrogen concentrations in this watershed are highest in areas with the greatest density of septic systems. Changes in nitrogen have occurred over time in both watersheds, loads have generally increased in Difficult Run and have mixed responses in Smith Creek. These patterns and other responses will be explored in relation to the variety of management practices installed in each watershed.

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