

**Title:** Contaminants of Mixed-Use Watersheds in West Virginia

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**Abstract**

An exploratory study was conducted in an urbanizing, mixed-land-use Appalachian watershed. Six study sites, characterized by contrasting land use/land cover, were instrumented to continuously monitor stream stage. Weekly grab samples were collected from each site and analyzed for elemental composition via spectrometric and spectrophotometric methods. Additional physico-chemical parameters were measured *in situ*. Data were analyzed using a suite of statistical methods, including hypothesis testing, correlation analysis, and Principal Component Analysis (PCA). Significant differences ( $p < 0.05$ ) between study sites were identified for nearly every measured parameter. PCA results highlight consistent spatial differences between elemental composition and physico-chemical characteristics of streamwater samples. Results from correlation analyses indicate varying significant ( $p < 0.05$ ) relationships between chemical parameters and hydroclimate metrics, with certain elements (e.g. Ca, Sr) and physico-chemical parameters (e.g. specific conductance) displaying greater sensitivity to hydroclimate at mixed-land-use sites, as compared to predominately urban, agricultural, or forest sites. Given the geological, topographical, and climatological similarities between the sites, and their close proximity, it was concluded that land use characteristics and associated hydrologic regime contrasts were the primary factors contributing to the observed results. Results comprise valuable information for land and water managers seeking to mitigate the impacts of land use practices on water resources and aquatic ecosystem health. The applied methodology can be used to more effectively target sub-watershed-scale remediation/restoration efforts within mixed-use watersheds, thereby improving the ultimate efficacy of management practices.