

Continuous Water-Quality Monitoring in Karst Basins – Issues in Assessing Nitrate-Nitrogen and Dissolved Solutes Concentrations

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Biographical Sketches of Authors

Joseph Taraba is an extension specialist and researcher in areas of agricultural waste management, groundwater quality and more recently watershed surface water quality monitoring strategies for assessment of agricultural BMP implementation in karst basins.

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Abstract

The assessment of the Total Maximum Daily Load (TMDL) and the effectiveness of Best Management Practices (BMPs) on water quality in watersheds require the accurate measurement of constituent concentration and stream flow. Due to the volatile nature of stream flow and constituent concentration in upland watersheds, and especially in karst basins, interest in continuous water-quality monitoring has increased. Continuous flow measurement has been relatively simple and inexpensive to accomplish in comparison with the continuous measurement of the concentration of constituents such as Nitrate-Nitrogen.

Although expensive, continuous concentration monitoring allows researchers and planners to assess not only yearly and seasonal variations, but sub-seasonal variations as small as diurnal changes in concentration. The ability to monitor these types of variations can shed light on the dynamics of constituent generation and fate. Continuous monitoring can also help ascertain whether coarser sampling strategies such as biweekly, monthly, and even storm sampling are adequate or inadequate for TMDL and BMP analyses.

Given the advantages of continuous monitoring, a major issue arises around the reliability of certain ion-specific probes and the aspects of QA/QC of data generated by these probes. These issues are important but can be adequately addressed by proper procedures.

Based on affirming probe reliability, our suggests that diurnal patterns (the timing of diurnal concentration max/mins and amplitudes) may be correlated to stream status and ecosystem equilibrium as the stream corridor recovers from a disturbance or the landuse within a stream corridor shifts.