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Preliminary Evaluation of Effects of Best Management Practices in the Black Earth Creek, Wisconsin, Priority Watershed

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Nonpoint-source contamination accounts for a substantial part of the water quality problems in many watersheds. The Wisconsin Nonpoint Source Water Pollution Abatement Program provides matching money for voluntary implementation of various best management practices (BMPs). The effectiveness of BMPs on a drainage-basin scale has not been adequately assessed in Wisconsin by use of data collected before and after BMP implementation.

The U.S. Geological Survey, in cooperation with the Wisconsin Department of Natural Resources, monitored water quality in the Black Earth Creek watershed in southern Wisconsin from October 1984 through September 1986 (pre-BMP conditions). BMP implementation began during the summer of 1989 and is planned to continue through 1993. Data collection resumed in fall 1989 and is intended to provide information during the transitional period of BMP implementation (1990-93) and 2 years of post-BMP conditions (1994-95).

Preliminary results presented for two subbasins in the Black Earth Creek watershed (Brewery and Garfoot Creeks) are based on data collected during pre-BMP conditions and the first 3 years of the transitional period. The analysis includes the use of regressions to control for natural variability in the data and, hence, enhance the ability to detect changes. Data collected to date (1992) indicate statistically significant differences in storm mass transport of suspended sediment and ammonia nitrogen at Brewery Creek. The central tendency of the regression residuals has decreased with the implementation of BMPs; hence, the improvement in water quality in the Brewery Creek watershed is likely a result of BMP implementation. Differences in storm mass transport at Garfoot Creek were not detected, primarily because of an insufficient number of storms in the transitional period. As practice implementation continues, the additional data will be used to determine the level of management which results in significant improvements in water quality in the two watersheds. Future research will address techniques for including snowmelt runoff and early spring storms.

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