Public Abstract

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Title:DEVELOPMENT OF IMPLEMENTATION METHODS OF WATER QUALTIY TRADING POLICY: USING HYDROLOGICAL SIMULATION PROGRAM-FORTRAN (HSPF)

The recently promulgated water quality trading (WQT) policy is an innovative approach for achieving water quality standards with flexibility and economic efficiency. The policy allows for the trading of point and nonpoint source pollutant discharges between different locations within a watershed, as long as water quality standards are not violated along the stream. Many pilot programs and projects have generated useful information on how to implement water quality trading, but the number of actual trades is relatively small. The difficulty in determining the equality of trading locations and the uncertainty of nonpoint source pollutant concentrations in streams hinder the implementation of the trading program.

The hydrological simulation program-fortran (HSPF) was used to estimate the hydrology and sediment loading throughout the Brush Creek, MO watershed for future land use development scenarios between upstream and downstream locations. Brush Creek does not have a proper monitoring station for calibration and validation of the watershed model. Thus, the Meramec River watershed which drains to the Meramec River near Eureka, MO station (07019000) was selected for input parameter calibration because the watershed contains the Brush Creek watershed as a subbasin.

The development scenarios considered include upstream and downstream development from agricultural, forest, and range land to urbanized development with 25, 50, and 75 percent impervious surface through manually modified land use maps. Restoration scenarios would return agricultural areas to range land in both the upstream and downstream locations. Their hydrologic and sediment impacts to the outlet of the watershed were simulated in order to provide an estimate of how this particular land use change might be incorporated into a water quality trade.

After sediment calculations for 20 different scenarios were performed in HSPF, equivalent acreages for sediment generation between upstream and downstream locations were developed as potential water quality trading units. Recommended equivalent acreages for the nonimparied and impaired stream cases were provided as references for a trading program manager in order to implement the water quality trading policy.