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## **Effectiveness of Continuous Stream Monitoring to Target High Polluting Sub-Watersheds within Larger Watersheds**

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### Abstract:

The Big Creek Middle Smoky Hill River Watersheds (two, HUC 8s) encompass 10 counties in west-central Kansas, covering approximately 2,400 square miles, eventually ending at Kanopolis Reservoir in Ellsworth County, Kansas. The primary threats to water quality within the watersheds are sedimentation, Eutrophication, and fecal coliform bacteria. Currently, Kanopolis Reservoir is listed on the State of Kansas' 303d Impaired Waters.

In 1946 the original multi-purpose pool and flood pool storage capacities of Kanopolis Reservoir were 447,251 acre-feet with a designed sedimentation rate of 564 acre-feet/year. A 1993 sedimentation survey estimated the current rate to be 643 acre-feet/year; a 13% increase from designed rates. Presently, the estimated current capacity is at 409,383 acre-feet or 9.15% loss of capacity due to sedimentation. One of Kanopolis Reservoir's state designated uses is domestic water supply which supplies water for eleven wholesale accounts encompassing seven cities and four rural water districts. This equates to a maximum quantity of 400 million gallons per year.

Water quality improvements can only be realized by targeting best management practices for TMDL reductions because of the watershed's size. Current watershed models cannot show areas of high loading because specific water quality data is lacking. In late 2006, a watershed water quality monitoring project was initiated with three components: 1) determine the pollutant loading from the only NPDES Phase II permitted city in the watersheds; 2) determine pollutant loading from agriculture land and other smaller communities in the watersheds; and 3) post data, along with educational material, ongoing events in the watershed, and complimentary watershed projects on the [www.MyKansasWatershed.com](http://www.MyKansasWatershed.com) website.

After analyzing sampling data and computer generated watershed rankings, we should be able to increase the effectiveness of best management practices by targeting high loading areas. This will be accomplished by working with producers within targeted HUC 14 watersheds to implement TMDL reduction efforts.

### Impact Statement:

Establishing partnerships with county extension offices, conservation district offices, NRCS field offices, United States Army Corp of Engineers, local watershed producers, and city and county governments through monitoring and implementation activities have opened the lines of communications amongst agencies and landowners. We anticipate landowner promotion and installation of best management practices by leveraging local, state and federal funds to supplement cost-share.

The project's monitoring effort will identify priority pollution sources and their extent from the Big Creek and Middle Smoky Hill River Watersheds, as well as target outreach activities and implement practices that work to reduce TMDL impairments therefore granting TMDL delisting

Data collected will assist extension educators working to improve local understanding of water management and impacts on stream and lake water quality while guiding decision partnerships through the best use of funds in the watershed.

Category: Watershed Assessment and Restoration  
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