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## **Evaluation of SWAT and AnnAGNPS in the Cheney Lake Watershed CEAP**

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### **Abstract Text:**

Non-point source pollution has been considered as one of the major sources of pollution to the water bodies in the United States. Total maximum daily loads (TMDLs) have been developed by the Kansas Department of Health and Environment (KDHE) for various water bodies in Kansas. Conservation practices have been implemented throughout the State to mitigate the impacts of agricultural pollution and sedimentation. However, an assessment of the conservation practices is needed. Watershed models can be useful tools for large-scale land management and water quality assessment. The objectives of this study are to (i) calibrate and validate two most widely used USDA watershed models (SWAT and AnnAGNPS) and (ii) assess the performance of each model based on predictions of flow, sediment yield, and total phosphorus using coefficient of determination ( $R^2$ ), and Nash Sutcliffe Efficiency Index (E). The utility of each model to simulate conservation practices effects on water quality, user friendliness, prospective and constraints to simulate field conditions will be presented. This study will be conducted under the USDA-Conservation Effects Assessment Project (CEAP) on the Red Rock Creek and Goose Creek sub-watersheds with in the Cheney Lake watershed which is located in the South-Central Kansas. The models will be calibrated at the Goose Creek watershed and validated at the Red Rock Creek watershed. The models' predicted results will be compared with forty five months (1997- 2000) of USGS measured data to provide baseline calibration and validation. This study will be continued to assess effectiveness of conservation practices in the whole Cheney Lake watershed using the most appropriate watershed water quality model.

### **Impact Statement:**

Hydrologic and water quality models are often used to identify and quantify pollutant sources so that the pollution from those sources may be reduced in order to improve water quality. Watershed models are used to identify the level of impairment and then prioritize watersheds for water quality improvement through implementing Best Management Practices (BMPs). A calibration and validation of models (SWAT and AnnAGNPS) is needed to understand the background, potentials, and limitations of models before assessing and recommending any BMPs. This study will help to determine the effects of agricultural conservation practices during the simulation period on water quality trends in the Red Rock Creek and Goose Creek sub-watersheds of the Cheney Lake Watershed.