



Title: Using SWAT to Target Critical Source Sediment and Phosphorus Areas in the Wister Lake Basin, USA

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Abstract: Problem statement: Wister Lake is located in the San Bois Mountains in southeastern Oklahoma, USA. The reservoir is primarily used as a water supply and flood storage to over 40,000 residents in the area. Due to high levels of phosphorus and sediment, Wister Lake is listed as a high priority basin for the State of Oklahoma. To help address these water quality problems, the Oklahoma Conservation Commission provided cost share funds for landowners in the basin to implement conservation practices. Approach: The objective of this study was to identify or target agricultural land that contributed disproportional pollutant losses, i.e. critical source areas. Results: Implementing conservation practice in these critical source areas allowed optimal placement conservation practices. The Soil and Water Assessment Tool (SWAT) model was used to identify critical source areas of phosphorus and sediment in the Wister Lake basin. SWAT predicted 57,000 metric tons a year of sediment and 84,000 kilograms a year of total phosphorus from upland areas in the basin. Eighty-five percent of the pollutant load originated from just 10% of the basin. Conclusion/Recommendations: This allowed the OCC to identify and contact specific agricultural producers to recruit into their water quality program, which optimized the use of limited cost share funds.