



Title: Addressing Watershed Nonpoint Source Pollution with an integrated environmental and economic compute

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Theme: Watershed Management

Situation: Water quality degradation resulting from agricultural nonpoint sources is an acute problem for many watersheds across the U.S. Integrated modeling has been performed by TIAER and CARD to assess the environmental and economic impacts of alternative practices for the Mineral Creek Watershed, and previously for other watersheds in Texas and Iowa, in an effort to help mitigate nonpoint source pollution problems. Results of the Mineral Creek analysis have been presented directly to stakeholders living in the watershed. Results will also be disseminated to the wider research community.

Objectives: Three main objectives motivate watershed studies using the Comprehensive Economic and Environmental Optimization Tool (CEEOT); (1) Informing stakeholders of the environmental impacts of various farm practices, (2) Informing stakeholders of the impacts of those practices on farm profits, and (3) Informing the research community and the general public of the cost-effectiveness of various practices so that the most appropriate practices would be supported in specific situations.

Methods: Extensive data was collected in collaboration with stakeholders to evaluate practices for Mineral Creek. Then the CEEOT modeling system was calibrated and employed to evaluate a wide variety of structural and managerial practices of interest to stakeholders. Producers and other stakeholders were encouraged to provide input throughout the entire process. Results from the simulations and analyses were shared with producers through presentations, and reports and journal articles are forthcoming that will be shared with stakeholders and the research community.

Partnerships: Environmental and economic analysis of practices in the Mineral Creek and other watersheds has benefited substantially from partnerships with local NRCS, SWCD and Extension service personnel, as well as other university professionals.

Research: This project built on previous research performed for another watershed located in the same region as Mineral Creek. Further research was conducted to configure the modeling system more accurately for Mineral Creek. Local stakeholders learned about the inputs and assumptions to the models from the research team, and took an active role in reviewing and revising the model inputs. The stakeholders also proposed several of the scenarios that were included in the analysis. The Scenario results were presented to the stakeholders in collaboration with ISU extension.

Resources: USEPA Section 319 and Water Quality Coop. Agreements programs provided substantial funds. ISU scientists contributed staff time and some analytical costs. Iowa NRCS supplied GIS coverages and the Conservation District Commissioners sponsored a farm practices survey.

Results: An analysis of different management strategies was performed with the modeling system. The scenario results were presented to the Mineral Creek stakeholders; these provide them with improved understanding of the potential impacts of different management practices. Some producers in the Mineral Creek watershed have already adopted improved nutrient management and conservation practices. The modeling results can help guide them as they continue to implement changes and work with their Conservation District to recommend cost-shared practices for watershed protection funding.



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