

Public Abstract

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Title:Streambank Erosion and Risk Assessment of Contaminant Transport in Missouri Watersheds

Sedimentation and herbicide contamination are significant water quality concerns in claypan watersheds. Two separate studies were conducted in northern Missouri in the Central Claypan Region. A project investigating the effects of season, land use, and stream order on streambank erosion rates was conducted in Crooked and Otter Creek watersheds. Season was found to be the most important factor controlling bank erosion rates, while the land use and stream order effects did not have a large effect. Streambanks were determined to contribute a large portion of in-stream sediment, nearly 60%. A second project involved the development of a computer model for predicting the risk of pesticide loss in Youngs Creek watershed. The model used components of soil, landscape, hydrologic, and herbicide properties to assess risk of herbicide loss for difference hydrologic loss pathways- leaching, solution runoff, and particle adsorbed runoff. Application of a restrictive clay layer criterion was crucial for assessing risk between loss pathways in Youngs Creek claypan soils. The model correctly identified differences in risk for different soil types, distinguishing between soils that were very dissimilar, as well as soils that had subtle differences. The model was sensitive to differences in the tested herbicides, which had a large range of chemical properties. The approach of the developed model allows for quantifying the risk of herbicide loss on the watershed-scale over time and space, and is potentially useful as a management tool for targeting management practices to the areas most vulnerable to herbicide loss in a watershed.