

**Evaluation of Field Jet Erosion Tests and WEPP-Predicted
Erodibility Parameters in Forests and Grasslands**

Whitney Lisenbee*, Dr. Garey Fox, and Dr. Ron Miller
Department of Biosystems and Agricultural Engineering
Oklahoma State University, Stillwater, OK

whitney.lisenbee@okstate.edu

Vegetation has been shown to reduce erosion through many studies. Individual species of vegetation have been studied to determine their effect on erosion but has focused mostly on agricultural settings. This study evaluated erodibility parameters under two distinct land covers: tallgrass prairie grassland and an encroaching Eastern Redcedar forest. The erodibility parameters from each watershed were estimated by the hydrologic model, the Water Erosion Prediction Project (WEPP). WEPP is often used to determine the runoff and sediment yield of a given field site using input data such as the slope, climate, soil and land management characteristics. Currently, WEPP uses empirical equations to determine two major erodibility parameters within in the soil input file: the critical shear stress (τ_c) and the erodibility coefficient (kd). It also uses adjustment coefficients to account for seasonal variations and vegetation. In addition to modeling, field testing was completed to determine these two parameters mechanistically using the Jet Erosion Test (JET). The JET data was compared to WEPP-predicted values of τ_c and kd. The adjusted kd predicted by WEPP for all watersheds was under predicted compared to JET-measured data. The WEPP results were directly correlated with the soil texture since that is the basis of its empirical equations. However, JET results showed erodibility parameters of the two vegetation types to be more similar. The grassland sites had kd values that were two to four times smaller than the forested sites. The importance of these results is to demonstrate that erodibility parameters based on soil texture may not best represent the true susceptibility of an area to erosion.