

Indiana Field Office Technical Guide

SECTION I- General Resource References - Erosion Prediction

Revised Universal Soil Loss Equation (RUSLE)

RUSLE is an updated version of the Universal Soil Loss Equation (USLE) and Agricultural Handbook 537. The original USLE has been retained in RUSLE; however it has been put into a computer program to facilitate calculations, and the technology for factor evaluation has been altered and new data has been introduced to evaluate each factor under more specific conditions.

RUSLE uses the same USLE formula

$A = R * K * LS * C * P$. Where:

A = Predicted Average Annual Soil Loss (Tons/Acre/Year)

R = Rainfall Runoff Erosivity Factor

K = Soil Erodibility Factor

LS = Length-Slope Factor

C = Cover-Management Factor and

P = Support Practice Factor

RUSLE is a tool to predict long-term average annual soil loss in ton/acre/year from specific field conditions using specific management systems. RUSLE cannot be used to estimate or predict soil loss from individual storms nor from a particular year of weather and related factors. The factors used in the RUSLE are based on long-term averages.

RUSLE is being replaced by RUSLE2. RUSLE2 is an enhanced version of RUSLE and is presented in a Microsoft Windows format. RUSLE2 is scheduled to be in NRCS Field Offices by January 1, 2003.

Wind Erosion Equation (WEQ) and Wind Erosion Prediction System (WEPS)

Using wind tunnels and field studies, workers in the mid-1950's developed the first wind erosion prediction equation. The equation expressed in function form is:

$E = f(I, K, C, L, V)$ where

E is the potential average annual soil loss

I is the soil erodibility index,

K is the soil ridge roughness factor,

C is the climate factor

L is unsheltered distance across a field and

V is the equivalent vegetative cover.

WEQ is currently the most widely used method for assessing average annual soil loss by wind from agricultural fields. The primary user of WEQ is the Natural Resources Conservation Service (NRCS). WEQ is going to be replaced with the Wind Erosion Prediction System (WEPS).

WEPS - The Wind Erosion Prediction System (WEPS) is a daily simulation model which

outputs average soil loss and deposition values for selected areas and periods of time. It is applicable to just one field, or can be applied to a few adjacent fields. Efforts are currently underway to complete the development of this new Wind Erosion Predictions System.

More information on Water and Wind Erosion:

[Predicting Soil Erosion by Water with the Revised Universal Soil Loss Equation \(RUSLE\) Agriculture Handbook Number 703](#)

[Vegetec - Assistance to help implement vegetative practices](#)

[Water and Wind Erosion Tools](#)

[Wind Erosion Equation \(WEQ\) Guidance Document](#)

[Wind Erosion Equation \(WEQ\) Input Worksheet](#)