

RHEM Equation Summary

Updated: 3/31/2014

Ft (friction factor)

$$\text{Log}_{10}(\text{Ft}) = -0.109 + (1.425 * \text{littercover}) + (0.442 * \text{rockcover}) + (1.764 * (\text{basalcover} + \text{cryptogams})) + 2.068S$$

Ke (Green-Ampt Hydraulic Conductivity)

Shrub Vegetation Community

$$\text{Keb} = \{ \exp^{[0.174 - (1.450 * \text{meanclay}) + (2.975 * \text{groundcover}) + (0.923 * \text{canopycover})]} \}$$
$$\text{Ke} = (\text{Keb} * 0.3) * 1.2$$

Sod Grass Vegetation Community

$$\text{Keb} = \{ \exp^{[0.174 - (1.450 * \text{meanclay}) + (2.975 * \text{groundcover}) + (0.923 * \text{canopycover})]} \}$$
$$\text{Ke} = (\text{Keb} * 0.3) * 0.8$$

Bunch Grass Vegetation Community

$$\text{Keb} = \{ \exp^{[0.174 - (1.450 * \text{meanclay}) + (2.975 * \text{groundcover}) + (0.923 * \text{canopycover})]} \}$$
$$\text{Ke} = (\text{Keb} * 0.3) * 1.0$$

Forbs Vegetation Community

$$\text{Keb} = \{ \exp^{[0.174 - (1.450 * \text{meanclay}) + (2.975 * \text{groundcover}) + (0.923 * \text{canopycover})]} \}$$
$$\text{Ke} = (\text{Keb} * 0.3) * 1.0$$

Kss (Splash and Sheet erosion parameter)

Shrub Vegetation Community

$$\text{Log}_{10}(\text{Kss}) = 4.00836 - (1.17804 * \text{rockcover}) - (0.98196 * (\text{littercover} + \text{canopycover}))$$

Sod Grass Vegetation Community

$$\text{Log}_{10}(\text{Kss}) = 3.13334 - (0.20055 * \text{canopycover}) - (0.50550 * \text{littercover})$$
$$\text{Kss} = (\text{Kss}/1.5)$$

Bunch Grass Vegetation Community

$$\text{Log}_{10}(\text{Kss}) = 3.13334 - (0.20055 * \text{canopycover}) - (0.50550 * \text{littercover});$$

Forbs Vegetation Community

$$\text{Log}_{10}(\text{Kss}) = 3.13334 - (0.20055 * \text{canopycover}) - (0.50550 * \text{littercover})$$

Multiply Kss for all cases by 1.3 in order to account for the bias in the log transformation (relative to Duan 1989)

$$\text{Kss} = \text{Kss} * 1.3$$

[Duan, Naihua. 1983. Smearing Estimate: A Nonparametric Retransformation Method, *Journal of the American Statistical Association*, Vol., 78, No. 3838. (Sep., 1983), pp. 605-610.]