Effective Hydraulic Conductivity $K_e$

*Updated 01/12/2022*

$$K_{ei} = K_{bi} e^{p_i(basalcover + littercover)}$$

In this equation $K_{bi}$ is the 25% percentile saturated hydraulic conductivity for each soil textural class, $i$, reported by Rawls et al. (1998), $p$ is defined as the natural log of the ratio of the geometric mean to the 25% percentile values of saturated hydraulic conductivity; $basalcover$ is basal area cover (expressed as a fraction); $littercover$ is litter cover (expressed as a fraction).

Sand: \[ K_e = 64 \times [\exp(0.3564 \times (basalcover + littercover))] \]

Loamy Sand: \[ K_e = 30.5 \times [\exp(0.3056 \times (basalcover + littercover))] \]

Sandy Loam: \[ K_e = 5 \times [\exp(1.1632 \times (basalcover + littercover))] \]

Loam: \[ K_e = 2.5 \times [\exp(1.5686 \times (basalcover + littercover))] \]

Silt Loam: \[ K_e = 1.2 \times [\exp(2.0149 \times (basalcover + littercover))] \]

Silt: \[ K_e = 1.2 \times [\exp(2.0149 \times (basalcover + littercover))] \]

Sandy Clay Loam: \[ K_e = 0.8 \times [\exp(2.1691 \times (basalcover + littercover))] \]

Clay Loam: \[ K_e = 0.5 \times [\exp(2.3026 \times (basalcover + littercover))] \]

Silty Clay Loam: \[ K_e = 0.9 \times [\exp(1.4137 \times (basalcover + littercover))] \] * Stone et al. (1992)

Sandy Clay: \[ K_e = 0.3 \times [\exp(2.1203 \times (basalcover + littercover))] \]

Silty Clay: \[ K_e = 0.5 \times [\exp(1.2809 \times (basalcover + littercover))] \]

Clay: \[ K_e = 0.3 \times [\exp(1.7918 \times (basalcover + littercover))] \]

Reference:
