10. Listing of Pedotransfer Functions of Water Retention Characteristic

Table 31.1 Water retention pedotransfer functions – Horizon A

Soil	Equation	Parameter	M	RMSR	R^2	K	MD	RMSD
All duplex soils in SIR	$\theta(h)=\theta_r+\frac{(\theta_s-\theta_r)}{\left[1+(\alpha\ h)^N\right]^{(1-1/N)}}$ $\theta_s = b_1\ (1-BD/2.65) + b_2$ $\theta_r = r_1\ c + r_2\ s + r_3$ $\alpha = a_1 + a_2\ d_g$ $N = n_1 + n_2\ \sigma_g$	b_1= 1.258 b_2= – 0.0726 r_1= 0.00214 r_2= – 0.0015 r_3= 0.1 a_1= 0.1 a_2= 0.80 n_1= 1.10 n_2=0.0016	557	.043	0.78	63	0.000	0.032
Sandmount sand (This PTF could be used for other sandy soils of Group 1S which are expected to have similar shape of water retention curve as Sandmount sand)	$\theta(h)=\theta_r+\frac{(\theta_s-\theta_r)}{\left[1+(\alpha\ h)^N\right]^{(1-1/N)}}$ $\theta_s = s_1\ c + s_2\ BD + s_3$ $\theta_r = r_1\ c + r_2\ s$ $\alpha = a_1 + a_2\ d_g$ $N = n_1 + n_2\ \sigma_g$	S_1= 0.00724 S_2= – 0.454 S_3= 1.162 r_1= 0.002 r_2= 0.00047 a_1= – 0.724 a_2= 1.66 n_1= 2.917 n_2= – 0.461	16	0.019	0.98	2	0.00	0.020

Notations (see Chapter 4 for more details):

$\theta(h)$ is volumetric water content ($cm^3\ cm^{-3}$) at suction h (cm)
θ_r and θ_s are residual and saturated water contents, respectively, ($cm^3\ cm^{-3}$)
α is a scaling parameter (>0, in cm^{-1}) related to the inverse of the air entry suction
N (>1) is a curve shape parameter, a measure of the pore size distribution
c and s are clay and sand percentages in weight, respectively
BD is bulk density in g cm^{-3}
d_g is geometric mean diameter (mm)
σ_g is geometric standard deviation

M is number of data points
RMSR is root mean squares of residuals
R^2 is coefficient of determination
K is number of water retention curves
MD is mean deviation
RMSD is root mean square deviation

Table 31.2 Water retention pedotransfer functions – Horizon B1

Point Estimation	Equation	Parameter	M	RMSR	R^2	K	MD	RMSD
All duplex soil in SIR	$\theta(h)=\theta_r+\frac{(\theta_s-\theta_r)}{\left[1+(\alpha h)^N\right]^{(1-1/N)}}$ $\theta_s = s_1 c + s_2 BD + s_3$ $\theta_r = r_1 c + r_2 s + r_3$ $\alpha = a_1 + a_2 d_g$ $N = n_1 + n_2 \sigma_g$	s_1= 0.00058 s_2= – 0.322 s_3= 0.9575 r_1= 0.00109 r_2= – 0.003 r_3= 0.230 a_1= 0.096 a_2= 1.74 n_1= 1.329 n_2= – 0.0087	506	0.038	0.82	58	0.00	0.028
Sandmount sand (This PTF could be used for other sandy soils of Group 1S which are expected to have similar shape of water retention curve as Sandmount sand)	$\theta(h)=\theta_r+\frac{(\theta_s-\theta_r)}{\left[1+(\alpha h)^N\right]^{(1-1/N)}}$ $\theta_s = s_1 c + s_2 BD + s_3$ $\theta_r = r_1 c + r_2 s + r_3$ $\alpha = a_1 + a_2 d_g$ $N = n_1 + n_2 \sigma_g$	s_1= 0.011 s_2= – 0.331 s_3= 0.938 r_1= – 0.130 r_2= – 0.0045 r_3= 0.651 a_1= 1.691 a_2= – 1.355 n_1= 4.458 n_2= – 0.842	16	0.014	0.99	2	0.003	0.017

Notations (see Chapter 4 for more details):

$\theta(h)$ is volumetric water content ($cm^3\ cm^{-3}$) at suction h (cm)
θ_r and θ_s are residual and saturated water contents, respectively, ($cm^3\ cm^{-3}$)
α is a scaling parameter (>0, in cm^{-1}) related to the inverse of the air entry suction
N (>1) is a curve shape parameter, a measure of the pore size distribution
c and s are clay and sand percentages in weight, respectively
BD is bulk density in $g\ cm^{-3}$
d_g is geometric mean diameter (mm)
σ_g is geometric standard deviation

M is number of data points
RMSR is root mean squares of residuals
R^2 is coefficient of determination
K is number of water retention curves
MD is mean deviation
RMSD is root mean square deviation