Symbol	Description	Value	Units	Eq(s).
Group 1 – root submodel parameters				
$R*$	Total root biomass C in a 1 m deep by 1 cm^2 soil column	111.5	mg C cm^{-2}	3
R_{RBase}	Root mass-base respiration rate at 10 °C and mean environmental conditions	6×10^{-5}	mg C cm^{-3} h^{-1}	3
$\alpha_{1(R)}$	The effect of soil water content (θ) on root respiration	11.65	unitless	3, 4a
$\alpha_{2(R)}$	The effect of antecedent θ (θ_R^{ant}) on root respiration	20.7	unitless	3, 4b
$\alpha_{3(R)}$	The interactive effect of θ and θ_R^{ant} on root respiration	−164.2	unitless	3, 4c
Group 2 – microbial submodel parameters				
$S*$	Total soil organic C in a 1 m deep by 1 cm^2 soil column	711.6	mg C cm^{-2}	5
$M*$	Total microbial biomass C in a 1 m deep by 1 cm^2 column of soil	12.3	mg C cm^{-2}	5
V_{Base}	Value of V_{max} at 10 °C and mean environmental conditions	0.0015	mg C cm^{-3} h^{-1}	5, 6
$\alpha_{1(M)}$	The effect of θ on microbial respiration	14.05	unitless	5, 6
$\alpha_{2(M)}$	The effect of antecedent θ (θ_M^{ant}) on microbial respiration	11.05	unitless	5, 6
$\alpha_{3(M)}$	The interactive effect of θ and θ_M^{ant} on microbial respiration	−87.6	unitless	5, 6
K_{m}	Michaelis–Menten half saturation constant	10^{-5}	mg C cm^{-3} h^{-1}	5
CUE	Microbial carbon-use efficiency	0.8	mg C mg^{-1} C^{-1}	5
p	Fraction of soil organic C that is soluble	0.004	–	7
D_{liq}	Diffusivity of soil C substrate in liquid	3.17	unitless	7
Group 3 – shared parameters between root/microbial submodels				
E_o*	Temperature sensitivity parameter, somewhat analogous to an energy of activation	324.6	Kelvin	4c
T_o	Temperature sensitivity-related parameter	227.5	Kelvin	4c
α_4	The effect of antecedent soil temperature (T_S^{ant}) on root and microbial respiration	−4.7	unitless	4c
Group 4 – soil CO_2 diffusivity submodel parameters				
$\alpha_{3(R)}$	Absolute value of the slope of the line relating log(Ψ) versus log(θ)	4.547	unitless	2
BD	Soil bulk density	1.12	g cm^{-3}	2
φ_{g100}	Air-filled porosity at soil water potential of −100 cm H_20 (∼ 10 kPa)	18.16	%	2
PD	Particle density			