Chapter 17

Modeling the Dynamics of Soil Organic Matter and Nutrient Cycling

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TABLE S17.1 Observed changes in plant production, soil C, N, and P, resin extractable N and P, and N and P losses as a function of soil development chronosequence in Hawaii (Parton et al., 2005)

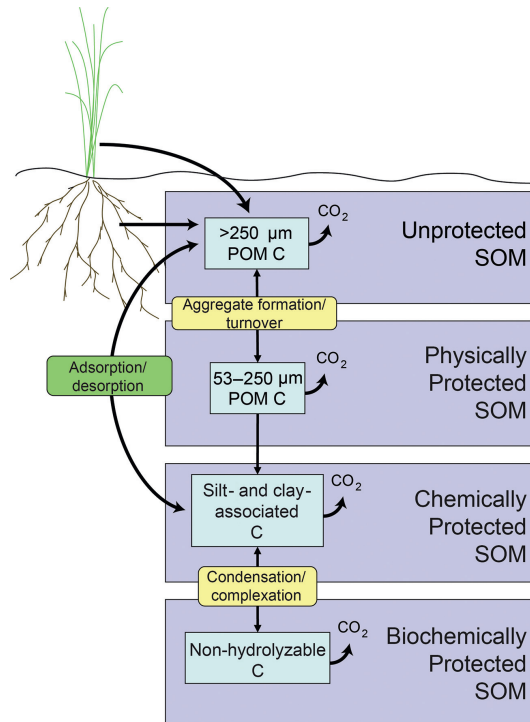| Ecosystem Properties	Time (thousands of years)					
	0.3	2	20	150	1400	4100
Plant Production (g C m^{-2} y^{-1})	580	———————	610	800	650	600
Soil Carbon (Kg m^{-2})	15.3	14.6	32.4	33.6	28.0	24.1
Soil N (Kg m^{-2})	0.98	0.98	1.50	1.46	1.38	1.13
Soil P Organic (Kg m^{-2})	0.030	0.95	0.155	0.20	0.11	0.11
Resin Extractable $NO_3 + NH_4$ (mg day^{-1} bag^{-1})	3.31	———————	12.37	5.2	14.55	14.31
Resin Extractable P (mg day^{-1} bag^{-1})	0.20	———————	1.21	2.19	0.51	0.41
N Loss NO_3 & Gas (Kg ha^{-1} y^{-1})	2.39	1.78	8.00	5.86	10.50	12.20
P Loss (Kg ha^{-1} y^{-1})	0.075	0.15	0.03	0.824	0.028	0.039

FIG. S17.1 A soil organic matter dynamics model based on measurable fractions that account for various protection mechanisms (redrawn from Six et al., 2002).