

Table S1. SOC stocks comparisons between soil horizons by land use land cover (LULC) and between LULC by Soil Horizon.

Land Use	Soil Horizon Comparisons by LULC		
	Ap vs Bt	Ap vs BC	Bt vs BC
Prairie Grass	<0.001 (Ap)	<0.001 (Ap)	0.684
Lawn Grass	0.089	0.022 (Ap)	0.16
Forest	0.271	0.212	0.661
Soil Horizon	LULC comparisons by Soil Horizon		
	PG vs. LG	PG vs. F	LG vs. F
Ap	0.723	0.019 (PG)	0.339
Bt	0.028 (LG)	0.087	0.91
BC	0.845	0.514	0.585

Table S2. Soil properties and calculated SOC stocks based on pedon measured values from the KSSL.

Soil Horizon	Horizon Thickness (cm)	Bulk Density (Bd)		Soil Organic Carbon (SOC) wt%	SOC Stock	
		33 kPa	Oven Dried (g cm ⁻³)		33 kPa	Oven Dried (Mg ha ⁻¹)
A	0–11	1.29	1.3	3.29	46.7	47.1
E	11–32	1.86	1.87	0.46	18.0	22.5
Bt1	32–58	1.69	1.72	0.13	5.7	5.8
Bt2	58–94	1.71	1.79	0.2	12.3	12.9
Bt3	94–155	1.62	1.62	0.12	11.9	11.9
Bt4	155–200	1.72	1.72	0.06	4.6	4.6

Table S3. Mean SOC stocks, 90% Confidence Interval (90% CI) and estimated difference between gSSURGO upper values (UV) and lower values (LV).

Soil Horizon	Prairie Grass		
	Horizon Thickness (cm)	SOC Stock	90% CI Width (Mg ha ⁻¹)
Ap		23.2	47.0
Bt		14	13.2
BC		20	18.6
Soil Horizon	Lawn Grass		
	Horizon Thickness (cm)	SOC Stock	90% CI Width (Mg ha ⁻¹)
Ap		23	47.9
Bt		27	20.4
BC		50+	14.1
Soil Horizon	Forest		
	Horizon Thickness (cm)	SOC Stock	90% CI Width (Mg ha ⁻¹)
Ap		21	28.9
Bt		29	20.9
BC		50+	23.0
KSSL			

Soil Horizon	Horizon Thickness (cm)	SOC Stock	gSSURGO UV-LV (Mg ha ⁻¹)	
A		11	47.1	63*
E		21	22.5	63*
Bt1		26	5.8	63*
Bt2		36	12.9	na
Bt3		61	11.9	na
Bt4		45	4.6	na