Supplementary Data, Mason, J. A., and Jacobs, P. M., "Chemical and particle size evidence for fine dust addition to soils of the midwestern United States", Soil profile descriptions and analytical data.

Table 1. Thomas Quarry site (Grimley et al., 1998). Quarry exposure, described from surface to base of Peoria Silt. Entire section described is Peoria Silt, with upper mineralogical zone from surface to -295 cm.

Horizon	Depth (cm)	Moist Color	Texture[a]	Structure[b]	Consistence[c]	Clay films[d]	Redox & other features[e]	Lower boundary[f]
A	0-13	10YR 4/2, 3/2	sil	1f sbk→ 1vf gr	mvfr	---	---	aw
E	13-20	10YR 5/3	sil	2f&m sbk	mfr	---	---	cs
BE	20-28	9YR 5/4	sil	2f&m sbk	mfr	---	10YR 5/3 silans	cs
Bt1	28-50	10YR 4/4	sicl	3m&f sbk	mfi	3tn cont 10YR 4/4 pf		gs
Bt2	50-80	10YR 4/4	sicl	2f pr→ 3 m/f sbk	mfi	3tn cont 9YR 4/4 pf	f1d mangans	gs
Bt3	80-114	10YR 5/6	sicl	1f pr→ 2m sbk	mfr	3mtk patchy 9YR 4/4 pf	---	gs
Bt4	114-134	10YR 5/6	sil	1-2m sbk	mfr	2tn patchy 9YR 4/4 pf	---	cs
BC	134-172	10YR 5/6	sil	1m-c sbk	mfr	1tn patchy 9YR 4/4 pf	---	aw
C1	172-208	10YR 6/4	sil	v1c sbk	mfr	---	f calcite nodules	c
ACb[g]	208-220	10YR 5/3	sil	v1f gr (compressed)	mfr	---	---	g
C2	220-295	10YR 6/4	sil	0m	mfr	---	---	a
Ab/C (Jules Geosol)	295-380	10YR 5/3, 6/4	sil	1f gr (compressed)	mfr	---	---	g
C3	380-810	10YR 6/4	sil	0m	mfr	---	---	

a) sil=silt loam, sicl=silty clay loam, scl=sandy clay loam, sic=silty clay, c=clay.
b) Grade: 1=weak, 2=moderate, 3=strong; Size: vf=very fine, f=fine, m=medium, c=coarse, vc=very coarse; Kind: gr=granular, pl=platy, sbk=subangular blocky, abk=angular blocky, pr=prismatic; →=parting to.
c) moist(m): vfr=very friable, fr=friable, fi=firm, vfi=very firm.
d) Amount: v1=very few, 1=few, 2=common, 3=many; Thickness: tn=thin, th=thick; Continuity: cont=continuous; Location: pf=ped faces, po=pores.
e) Quantity: f=few, c=common, m=many; Size: 1=<5 mm, 2=5-15 mm, 3=>15 mm; Contrast: f=faint, d=distinct, p=prominent.
f) a=abrupt, c=clear, g=gradual, s=smooth, w=wavy.
g) this zone was not sampled and therefore is not included in assumed parent material for elemental mass balance calculation.

Table 2. Cottonwood School site (Grimley et al., 1998). Roadcut exposure, described from surface to upper part of Jules Geosol zone. Entire section described is Peoria Silt, with upper mineralogical zone from surface to 330 cm depth.

Horizon	Depth (cm)	Moist Color	Texture[a]	Structure[b]	Consistence[c]	Clay films[d]	redox & other features[e]	Lower boundary[f]
Ap	0-21	10YR 4/2	sil	1vf gr	mvfr	---	---	cs
Bt1	21-52	8-9YR 4/4	sicl	3vf-f sbk	mfr	3tn cont pf	---	cs
Bt2	52-74	10YR 5/6	sil	2f-m sbk	mfr	2tn patchy pf	---	cs
BC	74-98	10YR 5/6	sil	1m-c sbk	mfr	---	---	as
C	98-330	10YR 6/4	sil	v1c sbk	mfr	---	---	cs
ACb (Jules	330+		sil	v1f gr (compressed)				gs

Horizon	Depth (cm)	Moist Color	Texture[a]	Structure[b]	Consistence[c]	Clay films[d]	redox & other features[e]	Lower boundary[f]
Geosol)								

a) sil=silt loam, sicl=silty clay loam, scl=sandy clay loam, sic=silty clay, c=clay.
b) Grade: 1=weak, 2=moderate, 3=strong; Size: vf=very fine, f=fine, m=medium, c=coarse, vc=very coarse; Kind: gr=granular, pl=platy, sbk=subangular blocky, abk=angular blocky, pr=prismatic; →=parting to.
c) moist(m): vfr=very friable, fr=friable, fi=firm, vfi=very firm.
d) Amount: v1=very few, 1=few, 2=common, 3=many; Thickness: tn=thin, th=thick; Continuity: cont=continuous; Location: pf=ped faces, po=pores.
e) Quantity: f=few, c=common, m=many; Size: 1=<5 mm, 2=5-15 mm, 3=>15 mm; Contrast: f=faint, d=distinct, p=prominent.
f) a=abrupt, c=clear, g=gradual, s=smooth, w=wavy.

Table 3. Oak Ridge Site (core description). Stratigraphy: Peoria Silt (0 – 277 cm), transition zone (277 - 281 cm), Roxana Silt (281 – 299 cm), mixed weathered loess and bedrock residuum (299 – 350 cm).

Horizon	Depth (cm)	Moist Color	Texture[a]	Structure[b]	Consistence[c]	Clay films[d]	Redox & Other features[e]	Lower boundary[f]
A	0-12	10YR 3/2	sil	1f gr	mvfr	---		c
E	12-30	10YR 4/2	sil	1f gr, 1th pl	mfr	---		c
Bt1	30-58	10YR 4/4	sicl	1m→2f sbk	mfr	ctn patchy 10YR 4/3 pf		g
Bt2	58-78	10YR 4/4	sicl	1f-m pr→2m sbk	mfr	ctn cont 10YR 4/3 pf		g
Bt3	78-102	10YR 5/4	sil	1m pr→1m sbk	mfr	ctn patchy 10YR 4/4 pf		g
Bt4	102-117	10YR 5/4	sil	1m pr	mfr	ctn patchy 10YR 4/4 pf	c1f 2.5Y5/2	g
BC	117-135	10YR 5/4	sil	0m	mfr	ftn cont 10YR 5/3 po	c2f 10YR 5/6, 6/2	g
C1	135-159	10YR 5/4	sil	0m	mfr		c2f 10YR 5/6, 6/2	g
C2	159-176	2.5Y 5/4	sil	0m	mfr		f2d 10YR 5/8, 6/2	a
C3	176-230	2.5Y 5/4	sil	0m	mfr		f2d 10YR 5/8, 6/2	g
C4	230-277	2.5Y 5/4, 10YR 5/2, 6/2	sil	0m stratified	mfr		f1-2d 10YR 5/8	a
C5/2C	277-281	10YR 5/4, 4/3 7.5YR 4/2	sil	0m stratified	mfr			a
2C	281-299	10YR 4/3	l-cl	1th-m pl	mfi		f2d 7.5YR 5/8	g
3Ab	299-305	7.5YR 4/2,5/8 10YR 5/8	cl-scl	1f gr (compressed)	mfi			g
3Bt1b	305-327	7.5YR 4/2,5/8 10YR 5/8	scl	1m sbk	mfi			g
3Bt2b	327-350	7.5YR 4/2,5/8 10YR 5/8	scl	1m sbk	mfi			
core refusal								

a) sil=silt loam, sicl=silty clay loam, scl=sandy clay loam, sic=silty clay, c=clay.
b) Grade: 1=weak, 2=moderate, 3=strong; Size: vf=very fine, f=fine, m=medium, c=coarse, vc=very coarse; Kind: gr=granular, pl=platy, sbk=subangular blocky, abk=angular blocky, pr=prismatic; →=parting to.
c) moist(m): vfr=very friable, fr=friable, fi=firm, vfi=very firm.
d) Amount: v1=very few, 1=few, 2=common, 3=many; Thickness: tn=thin, th=thick; Continuity: cont=continuous; Location: pf=ped faces, po=pores.
e) Quantity: f=few, c=common, m=many; Size: 1=<5 mm, 2=5-15 mm, 3=>15 mm; Contrast: f=faint, d=distinct, p=prominent.
f) a=abrupt, c=clear, g=gradual, s=smooth, w=wavy.

Table 4. Chemical and Physical Data from Soil Profiles and Underlying Loess.

a. Thomas Quarry, Illinois

	Major Elements (%)											
Sample[a]	LOI	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Total
A (7.5 cm)	5.69	80.15	0.72	8.62	2.05	0.13	0.48	1.08	1.16	2.16	0.08	102.32
E (16.5 cm)	2.74	83.02	0.75	9.35	2.21	0.10	0.50	0.70	1.19	2.23	0.07	102.84
BE (24 cm)	2.77	79.96	0.74	10.29	2.80	0.07	0.63	0.68	1.12	2.26	0.07	101.38
Bt1(39 cm)[b]	4.09	72.56	0.73	13.39	4.41	0.07	1.10	0.72	0.89	2.18	0.11	100.24
	4.21	72.69	0.73	13.38	4.39	0.07	1.10	0.73	0.89	2.16	0.10	100.44
	4.18	72.25	0.72	13.24	4.51	0.07	1.10	0.72	0.89	2.17	0.10	99.94
Bt2 (65 cm)	3.86	71.54	0.66	12.79	4.72	0.10	1.12	0.71	0.93	2.21	0.11	98.75
Bt3 (97 cm)	3.50	74.59	0.69	11.84	4.31	0.10	0.98	0.69	1.07	2.34	0.11	100.21
Bt4 (124)	2.91	78.34	0.69	11.53	4.01	0.10	0.94	0.76	1.18	2.46	0.09	103.01
BC (153 cm)	2.13	78.65	0.68	10.32	3.58	0.09	0.85	0.91	1.34	2.41	0.11	101.06
C1 (175 cm)	13.96	59.57	0.43	6.91	2.58	0.07	6.63	8.64	1.06	1.87	0.09	101.82
C1 (185 cm)	14.47	58.55	0.41	6.88	2.61	0.07	6.42	9.44	1.03	1.86	0.09	101.85
C2 (232 cm)	14.94	57.52	0.43	6.73	2.51	0.07	6.82	9.63	1.03	1.80	0.09	101.56
C2 (282 cm)	16.06	55.53	0.39	6.23	2.33	0.06	7.03	11.09	1.05	1.75	0.08	101.59
Ab/C (300)	14.44	56.40	0.50	7.74	2.93	0.08	6.49	9.45	0.98	2.01	0.09	101.13
C3 (375 cm)	17.43	52.47	0.43	6.33	2.59	0.98	8.10	10.91	0.87	1.93	0.08	102.12
C3 (490 cm)	11.99	60.66	0.48	7.52	2.48	0.06	6.51	8.77	1.21	2.00	0.10	101.80
C3 (690 cm)	13.40	59.72	0.50	7.92	2.45	0.06	5.84	7.86	1.39	1.96	0.11	101.21

	Trace Elements (ppm)						Bulk Density	Thickness[c]	Clay
Sample[a]	Nb	Zr	Y	Sr	Rb	Ba	($g\ cm^{-3}$)	(cm)	%
A (7.5 cm)	17	481	31	119	70	603	1.14	13	16
E (16.5 cm)	17	483	30	119	74	600	1.45	7	18
BE (24 cm)	18	462	29	117	80	598	1.58	8	24
Bt1(39 cm)[c]	16	366	29	103	88	586	1.55	22	39
	15	359	28	102	88	593			
	15	363	29	104	88	601			
Bt2 (65 cm)	15	360	31	104	82	556	1.53	30	36
Bt3 (97 cm)	15	381	36	116	80	561	1.52	34	27
Bt4 (124)	15	392	37	128	78	560	1.47	20	23
BC (153 cm)	14	413	35	140	69	536	1.30	38	15
C1 (175 cm)	9	297	21	124	49	377	1.33		8
C1 (185 cm)	9	295	21	128	49	355	1.33		8
C2 (232 cm)	9	302	22	127	47	373	1.36		7
C2 (282 cm)	8	304	20	136	44	337	1.36		5
Ab/C (300)	11	324	25	124	58	391	1.45		12
C3 (375 cm)	9	349	23	117	51	344	1.35		9
C3 (490 cm)	10	366	23	145	51	386	1.49		7
C3 (690 cm)	11	353	22	163	52	423	1.44		8

a. Samples composited over 15 cm vertical thickness or entire thickness of horizons < 15 cm thick. Depth is center of vertical interval that was sampled. Sampled intervals were centered within horizons in the soil profile.

b. Elemental analyses were run on three separate subsamples of this horizon.

c. Vertical thickness of soil horizon (used in mass balance calculation).

b. Cottonwood School, Illinois

	Major Elements (%)											
Sample[a]	LOI	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Total
A (10.5 cm)	5.11	76.54	0.69	10.64	3.48	0.09	0.81	0.90	1.06	2.31	0.09	101.71
Bt1 (36.5 cm)	4.22	73.37	0.71	12.82	4.64	0.05	1.11	0.79	0.88	2.22	0.07	100.88
Bt2 (63 cm)	3.88	73.87	0.71	12.82	4.96	0.10	1.18	0.81	1.01	2.35	0.07	101.75
BC (86 cm)	4.75	73.60	0.67	10.37	4.05	0.10	1.96	2.23	1.12	2.35	0.10	101.30
C (103.5)	14.91	57.38	0.47	7.28	3.04	0.08	6.18	9.85	0.94	1.86	0.09	102.06
C (150)	15.95	55.40	0.45	6.82	2.81	0.08	6.34	11.12	0.93	1.76	0.08	101.72
C (200)	16.76	54.04	0.42	6.44	2.64	0.07	6.49	12.14	0.95	1.71	0.08	101.74
C (300)	16.65	54.10	0.43	6.31	2.56	0.07	6.96	11.53	0.99	1.75	0.08	101.43
ACb (339 cm)	16.14	53.74	0.50	7.59	2.92	0.08	6.71	10.93	0.92	1.92	0.09	101.53
C (435)	16.90	53.90	0.46	6.37	2.57	0.07	7.88	10.60	0.86	1.98	0.08	101.65

	Trace Elements (ppm)						Bulk Density	Thickness[b]	Clay
Sample[a]	Nb	Zr	Y	Sr	Rb	Ba	(g cm^{-3})	(cm)	%
A (10.5 cm)	15	451	32	106	76	530	1.16	21	24
Bt1 (36.5 cm)	15	398	30	94	83	522	1.24	31	38
Bt2 (63 cm)	15	390	37	103	82	548	1.41	22	33
BC (86 cm)	14	401	38	121	71	482	1.28	24	19
C (103.5)	10	313	25	116	50	380	1.31		11
C (150)	10	314	22	124	46	377	1.26		8
C (200)	8	309	22	134	44	350	1.32		8
C (300)	9	321	22	137	44	334	1.36		n.d.
ACb (339 cm)	10	309	24	130	55	381	1.52		12
C (435)	10	355	24	111	50	339	1.39		8

a. Samples composited over 15 cm vertical thickness or entire thickness of horizons < 15 cm thick. Depth is center of vertical interval that was sampled. Sampled intervals were centered within horizons in the soil profile.

b. Vertical thickness of sampled horizon (used in mass balance calculation).

c. Oak Ridge, Minnesota

	Major Elements (%)											
Sample[a]	LOI	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Total
5 cm (A)	5.83	76.49	0.71	10.22	2.56	0.11	0.73	0.89	1.35	2.01	0.09	100.98
25 cm (E)	3.47	79.33	0.72	10.48	2.54	0.12	0.71	0.90	1.39	2.04	0.08	101.78
45 cm (Bt1)	3.39	73.18	0.71	12.73	3.88	0.09	1.09	0.97	1.29	2.03	0.09	99.46
65 cm (Bt2)	3.33	73.35	0.70	12.96	4.00	0.10	1.13	1.10	1.43	2.03	0.13	100.25
85 cm (Bt3)	3.31	74.77	0.70	13.60	4.09	0.10	1.20	1.11	1.42	2.06	0.15	102.50
105 cm (Bt4)	3.33	73.40	0.67	13.04	3.78	0.12	1.26	1.13	1.38	2.09	0.15	100.33
125 cm (BC)	2.99	74.71	0.71	12.38	4.19	0.09	1.10	1.24	1.51	2.06	0.16	101.14
145 cm (C1)	2.51	76.32	0.70	12.11	3.77	0.09	1.04	1.36	1.63	2.07	0.16	101.76
165 cm (C2)	2.26	76.33	0.70	11.84	3.26	0.08	1.11	1.52	1.71	2.12	0.18	101.12
177 cm (C3)	10.08	64.94	0.58	10.22	3.29	0.05	3.61	5.32	1.40	1.88	0.16	101.55
195 cm (C3)	8.06	67.13	0.61	10.01	2.87	0.07	3.55	5.75	1.50	1.90	0.15	101.59
212 cm (C3)	8.81	65.87	0.60	9.74	2.89	0.07	3.78	6.34	1.49	1.87	0.15	101.60
245 cm (C4)	9.62	63.89	0.59	9.10	2.61	0.06	4.06	7.17	1.44	1.83	0.14	100.50

	Trace Elements (ppm)						Bulk Density	Thickness[b]	Clay
Sample[a]	Nb	Zr	Y	Sr	Rb	Ba	($g\ cm^{-3}$)	(cm)	%
5 cm (A)	15	499	28	148	77	650	1.41	15	19
25 cm (E)	16	515	29	156	77	675	1.53	20	17
45 cm (Bt1)	16	423	29	151	76	631	1.49	20	28
65 cm (Bt2)	14	431	34	171	73	633	1.46	20	26
85 cm (Bt3)	16	404	37	176	75	664	1.44	20	27
105 cm (Bt4)	15	382	36	169	74	673	1.47	20	27
125 cm (BC)	16	453	35	181	69	644	1.43	20	22
145 cm (C1)	14	460	35	193	68	616	1.36	20	20
165 cm (C2)	15	450	32	203	69	668	1.32	20	17
177 cm (C3)	12	355	28	178	61	585	1.47		17
195 cm (C3)	14	408	27	187	60	550	1.51		13
212 cm (C3)	13	400	27	187	57	519	1.48		
245 cm (C4)	13	400	27	181	54	477	1.58		

a. Samples within soil profile are 2-10 cm core segments taken at 20 cm intervals, rather than at midpoints of genetic horizons; depth given is midpoint of sampled interval. Horizon containing the sampled interval given in parentheses. Sampling interval slightly modified in Peoria Silt below soil profile to allow use of larger intact clods for bulk density measurements.

b. Thickness used in mass flux calculation, assuming samples represent 20 cm interval in which they are centered.

Table 5. Mass Fluxes of Major Elements (Using Zr as Index Element)

a. Thomas Quarry, Illinois

	Mass Flux (g cm^{-2})										
Sample	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Total
A	-1.87	0.01	-0.31	-0.29	0.00	-1.53	-2.15	-0.08	-0.11	-0.01	-6.35
E	-1.03	0.01	-0.15	-0.19	0.00	-1.05	-1.52	-0.05	-0.07	-0.01	-4.05
BE	-1.17	0.01	0.00	-0.14	0.00	-1.23	-1.81	-0.06	-0.07	-0.01	-4.48
Bt1	0.66	0.08	1.78	0.46	0.00	-2.43	-3.80	-0.13	-0.02	0.00	-3.40
Bt2	0.98	0.08	2.18	0.78	0.01	-3.19	-5.02	-0.15	0.01	0.00	-4.32
Bt3	0.56	0.08	1.72	0.58	0.01	-3.91	-6.02	-0.13	0.01	0.00	-7.09
Bt4	0.78	0.04	0.82	0.21	0.00	-2.31	-3.51	-0.05	0.02	-0.01	-4.01
BC	-0.49	0.05	0.54	0.06	0.00	-4.16	-6.15	-0.05	-0.05	-0.01	-10.25
Profile Sum	-1.58	0.35	6.58	1.48	0.01	-19.81	-29.97	-0.69	-0.28	-0.05	-43.95

b. Cottonwood School, Illinois

Sample	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Total
A	-0.65	0.02	0.25	-0.12	0.00	-2.07	-3.68	-0.07	-0.06	-0.01	-6.40
Bt1	1.28	0.06	1.66	0.44	-0.02	-2.74	-5.13	-0.13	-0.01	-0.02	-4.60
Bt2	1.66	0.05	1.39	0.48	0.00	-2.13	-4.04	-0.05	0.05	-0.01	-2.61
BC	0.97	0.03	0.56	0.16	0.00	-1.94	-3.69	-0.03	0.03	0.00	-3.90
Profile Sum	3.26	0.16	3.86	0.96	-0.02	-8.88	-16.54	-0.28	0.02	-0.04	-17.51

c. Oak Ridge, Minnesota

Sample	SiO_2	TiO_2	Al_2O_3	FeO	MnO	MgO	CaO	Na_2O	K_2O	P_2O_5	Total
5 cm (A)	-1.19	-0.01	-0.42	-0.21	0.00	-0.81	-1.39	-0.11	-0.07	-0.02	-4.21
25 cm (E)	-1.67	-0.01	-0.64	-0.35	0.01	-1.21	-2.08	-0.16	-0.11	-0.03	-6.26
45 cm (Bt1)	1.04	0.02	0.71	0.26	0.00	-0.82	-1.60	-0.08	0.02	-0.02	-0.46
65 cm (Bt2)	0.68	0.01	0.71	0.27	0.01	-0.82	-1.57	-0.05	0.00	-0.01	-0.76
85 cm (Bt3)	2.37	0.03	1.07	0.35	0.01	-0.71	-1.42	-0.02	0.05	0.00	1.73
105 cm (Bt4)	3.11	0.03	1.09	0.31	0.01	-0.65	-1.35	-0.01	0.09	0.00	2.64
125 cm (BC)	0.02	0.01	0.37	0.27	0.00	-0.86	-1.59	-0.05	-0.02	0.00	-1.84
145 cm (C1)	0.18	0.00	0.24	0.13	0.00	-0.85	-1.50	-0.02	-0.02	0.00	-1.84
165 cm (C2)	0.57	0.01	0.22	0.01	0.00	-0.78	-1.37	0.01	0.00	0.00	-1.33
Profile Sum	5.11	0.09	3.34	1.05	0.04	-7.51	-13.85	-0.47	-0.06	-0.08	-12.33