

Supplementary materials

Composition and sources of PM_{2.5} across urban and rural sites in the Midwestern United States

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Table S1. Statistical significance (p-value) of the non-parametric tests of U of Mann-Whitney (upper matrix) and Z of Kolmogorov-Smirnov (lower matrix) tests for secondary inorganic tracers and bulk organic carbon (OC and EC). Results in bold correspond to significant differences between the two sites (the null hypothesis is rejected) with $p > 0.05$.

Secondary Inorganic Tracers													
Sites	Cedar Rapids			Des Moines			Davenport			Montgomery		Van Buren	
	NH ₄ ⁺	SO ₄ ²⁻	NO ₃ ⁻	NH ₄ ⁺	SO ₄ ²⁻	NO ₃ ⁻	NH ₄ ⁺	SO ₄ ²⁻	NO ₃ ⁻	SO ₄ ²⁻	NO ₃ ⁻	SO ₄ ²⁻	NO ₃ ⁻
Cedar Rapids				0.43	0.52	0.10	0.36	0.15	0.90	0.06	0.06	0.42	0.07
Des Moines	0.50	0.69	0.06	0	1	0	0.07	0.02	0.16	0.25	0.71	0.91	0.94
Davenport	0.69	0.33	0.97	0.33	0.06	0.33	3	7	3	0.00	0.12	0.03	0.11
Montgomery	-	0.15	0.21	-	0.38	0.21	-	0.00	0.33	-	-	0.35	0.89
Van Buren	-	0.69	0.21	-	0.87	0.69	-	0.12	0.33	0.56	0.69	-	-
		9	1		8	9		4	6	8	9		

Organic and Elemental Carbon										
Sites	Cedar Rapids		Des Moines		Davenport		Montgomery		Van Buren	
	OC	EC	OC	EC	OC	EC	OC	EC	OC	EC
Cedar Rapids			0.890	0.443	0.359	0.058	0.001	0.001	0.001	0.001
Des Moines	1.000	0.841			0.359	0.279	0.001	0.001	0.001	0.001
Davenport	0.591	0.194	0.591	0.194			0.001	0.001	0.001	0.001
Montgomery	0.001	0.001	0.001	0.001	0.001	0.001			0.392	0.855
Van Buren	0.001	0.001	0.001	0.001	0.002	0.001	0.358	0.697		

Table S2. Statistical significance (p-value) of the non-parametric tests of U of Mann-Whitney (upper matrix) and Z of Kolmogorov-Smirnov (lower matrix). Results in bold correspond to significant differences between the two sites (the null hypothesis is rejected) with $p > 0.05$.

Crustal tracers															
Sites	Cedar Rapids			Des Moines			Davenport			Montgomery			Van Buren		
	Al	Ca	Si	Al	Ca	Si	Al	Ca	Si	Al	Ca	Si	Al	Ca	Si
Cedar Rapids				0.517	0.853	0.302	0.322	0.154	0.955	0.001	0.027	0.001	0.002	0.928	0.001
Des Moines	0.878	0.878	0.504				0.566	0.123	0.295	0.001	0.020	0.001	0.008	0.946	0.001
Davenport	0.504	0.336	1.000	0.878	0.336	0.504				0.004	0.001	0.001	0.031	0.207	0.031
Montgomery	0.001	0.053	0.001	0.004	0.058	0.001	0.002	0.003	0.001				0.356	0.031	0.039
Van Buren	0.018	0.979	0.001	0.018	0.979	0.004	0.009	0.504	0.069	0.504	0.144	0.080			

Anthropogenic tracers															
Sites	Cedar Rapids			Des Moines			Davenport			Montgomery			Van Buren		
	Fe	Zn	Pb	Fe	Zn	Pb	Fe	Zn	Pb	Fe	Zn	Pb	Fe	Zn	Pb
Cedar Rapids				0.308	0.127	0.982	0.001	0.001	0.001	0.362	0.007	0.099	0.004	0.031	0.813
Des Moines	0.336	0.211	0.878				0.001	0.001	0.001	0.919	0.323	0.108	0.001	0.835	0.928
Davenport	0.001	0.009	0.001	0.002	0.001	0.001				0.001	0.001	0.001	0.001	0.001	0.001
Montgomery	0.878	0.011	0.124	0.979	0.366	0.124	0.001	0.001	0.001				0.001	0.309	0.110
Van Buren	0.004	0.018	0.878	0.001	0.699	0.699	0.001	0.001	0.001	0.001	0.408	0.124			

Figure S1. A representative set of PMF factors deduced from PM_{2.5} speciation data from the Van Buren site. The left axis shows the log-transformed PM_{2.5} mass fraction of each species, whereas the right axis shows the percent of species attributed to that factor. The error bar shows the model uncertainty as one standard deviation.

