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SUPPORTING MATERIAL

Elemental composition of $PM_{2.5}$ in Shiprock, New Mexico, a rural community located near coal-burning power plants and abandoned uranium mine tailings sites

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Content

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Table S1. Sampling information for $PM_{2.5}$ samples. Values are the average of two co-collected filters

Sample	start Date	Sampling time (h)	Air volume (m^3)	$PM_{2.5}$ mass (mg)	$PM_{2.5}$ conc. ($\mu g/m^3$)
1a	4/12/2009	96	38.7	0.337	8.7
1b	4/19/2009	83	33.3	0.127	3.8
1c	5/3/2009	96	38.8	0.261	6.7
2	11/4/2009	96	38.7	0.295	7.6
3	11/11/2009	96	38.7	0.362	9.4
4	11/18/2009	96	38.7	0.450	11.6
5	11/25/2009	96	38.7	0.269	6.9
6	10/17/2010	96	38.7	0.245	6.3
7	10/24/2010	96	38.7	0.213	5.5
8	10/31/2010	96	38.7	0.206	5.3
9	11/7/2010	96	38.8	0.183	4.7

Table S2. Concentrations of elements (ng/m^3) in samples 1–9

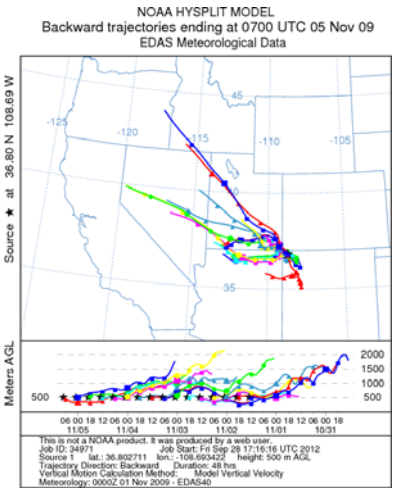
	1	2	3	4	5	6	7	8	9
Ag	<0.001	0.01	<0.001	<0.001	0.06	<0.001	<0.001	0.01	<0.001
Al	89.2	51.2	113	39.3	53.9	27.9	16.0	27.9	61.4
As	0.09	0.22	0.22	0.27	0.18	<0.02	<0.02	<0.02	<0.02
B	1.54	3.39	3.52	3.91	1.75	2.50	2.03	1.51	2.68
Ba	1.24	3.13	3.45	2.45	2.03	1.05	0.44	0.95	1.38
Be	<0.003	<0.003	0.01	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Bi	<0.001	0.03	0.07	0.03	0.03	0.02	0.01	0.01	0.01
Ca	90.9	38.9	139	30.3	36.0	31.5	5.98	20.5	48.2
Cd	0.003	0.03	0.06	0.05	0.04	<0.003	<0.003	<0.003	0.01
Ce	0.11	0.07	0.14	0.05	0.07	0.04	0.01	0.04	0.07
Co	<0.003	0.02	0.02	0.01	0.01	0.01	<0.003	0.05	<0.003
Cr	0.12	0.08	0.14	0.19	0.12	<0.005	<0.005	12.5	<0.005
Cs	<0.001	0.003	0.01	0.003	0.004	<0.001	<0.001	<0.001	<0.001
Cu	0.27	0.64	1.02	0.82	0.50	0.26	0.13	0.46	0.39
Fe	70.8	24.3	63.6	20.4	31.1	64.2	5.57	105	27.1
Ga	0.01	0.07	0.02	0.07	0.04	<0.006	<0.006	<0.006	<0.006
Ge	<0.009	0.04	0.03	0.11	<0.009	<0.009	<0.009	<0.009	<0.009
K	42.2	47.4	73.9	39.9	38.6	24.4	5.29	14.7	39.2
La	0.05	0.03	0.07	0.03	0.03	0.02	0.004	0.02	0.03
Li	<0.008	0.03	<0.008	0.10	0.03	<0.008	<0.008	<0.008	<0.008
Mg	21.6	8.39	20.7	8.71	11.6	6.20	2.10	4.84	9.87
Mn	1.44	0.62	1.60	0.57	0.77	1.00	0.17	1.00	0.60
Mo	<0.003	<0.003	<0.003	<0.003	<0.003	0.006	<0.003	0.46	<0.003
Na	9.72	10.6	33.9	9.36	18.1	16.6	9.84	7.26	8.35
Nd	0.04	0.03	0.06	0.02	0.02	0.02	<0.002	0.01	0.03
Ni	0.05	0.32	<0.006	0.48	0.13	0.11	<0.006	1.96	<0.006
P	1.26	2.16	1.39	2.32	1.33	2.66	0.22	1.02	1.31
Pb	0.48	0.43	1.03	1.04	0.39	0.35	0.20	0.23	0.47
Pr	0.01	0.01	0.01	0.003	0.01	<0.001	<0.001	<0.001	0.01
Rb	0.13	0.29	0.22	0.11	0.09	0.03	<0.001	0.01	0.06
Ru	<0.0003	<0.0003	<0.0003	<0.0003	0.001	<0.0003	<0.0003	<0.0003	<0.003
Sb	0.03	0.22	0.36	0.32	0.14	0.12	0.06	0.17	0.18
Se	0.17	2.11	<0.05	<0.05	0.68	<0.05	0.27	<0.05	<0.05
Sn	0.02	0.13	0.21	0.17	0.14	0.23	0.10	0.19	0.13
Sr	0.55	0.36	0.67	0.31	0.37	0.21	0.03	0.22	0.37
Th	0.01	0.01	0.01	0.01	0.03	0.004	<0.001	0.01	0.01
Ti	6.06	3.16	5.87	2.16	3.07	1.48	0.18	1.31	2.37
Tl	<0.001	0.01	0.01	0.02	0.01	<0.001	<0.001	<0.001	<0.001
U	0.002	0.02	<0.002	0.02	0.01	<0.002	<0.002	<0.002	<0.002
V	0.30	0.26	0.50	0.21	0.22	0.20	0.06	0.13	0.18
Y	0.03	0.02	0.04	0.02	0.02	0.01	0.004	0.01	0.02
Zn	0.92	2.18	1.76	5.67	1.22	0.42	0.45	0.32	0.78
Zr	0.14	0.13	0.26	0.10	0.14	<0.001	<0.001	0.03	0.04

Table S3. Upper crustal abundances used to calculate enrichment factors (Rudnick and Gao, 2005)

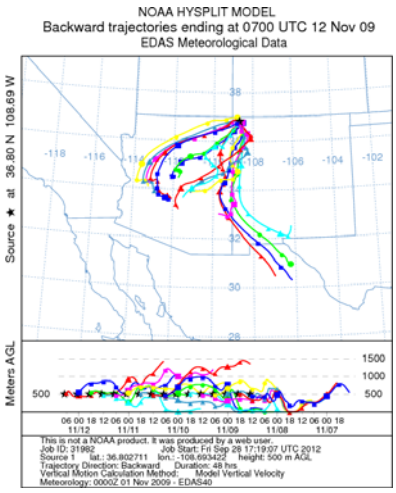
Element	µg/g
Al	81500
B	17
Ba	628
Bi	0.16
Ca	25700
Ce	63
Cu	28
Fe	39200
K	23200
La	31
Mg	15000
Mn	775
Na	24300
Nd	27
P	655
Pb	17
Rb	84
Sb	0.4
Sn	2.1
Sr	320
Th	10.5
Ti	3840
V	97
Y	21
Zn	67

Table S4. Varimax rotated component matrix with four principal components for 25 elements and percent variance of the sources via PCA

Species	PC1	PC2	PC3	PC4
Al	0.917	-0.104	0.221	0.227
B	0.127	0.627	0.664	0.073
Ba	0.745	0.472	0.418	0.040
Bi	0.021	0.858	0.284	0.393
Ca	0.962	0.005	0.073	0.186
Ce	0.984	0.071	0.111	0.056
Cu	0.640	0.631	0.285	-0.065
Fe	0.719	0.093	-0.637	-0.137
K	0.922	0.225	0.289	0.051
La	0.981	0.122	0.130	0.045
Mg	0.963	-0.113	0.164	0.154
Mn	0.899	0.074	-0.371	0.033
Na	0.373	0.333	-0.006	0.840
Nd	0.977	0.077	0.096	0.096
P	0.704	0.453	0.035	-0.319
Pb	0.648	0.312	0.569	0.103
Rb	0.901	0.202	0.325	-0.067
Sb	0.194	0.923	0.224	-0.026
Sn	-0.219	0.955	-0.125	0.095
Sr	0.984	0.134	0.048	-0.072
Th	0.813	0.140	0.030	0.068
Ti	0.994	0.034	0.089	-0.016
V	0.943	0.179	0.142	0.184
Y	0.942	0.083	0.249	0.203
Zn	0.392	0.283	0.831	-0.093
Variance (%)	61	17	11	5



Sample 2 (Nov. 1–4, 2009)



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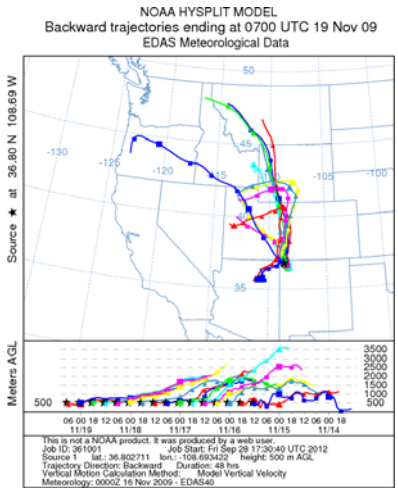
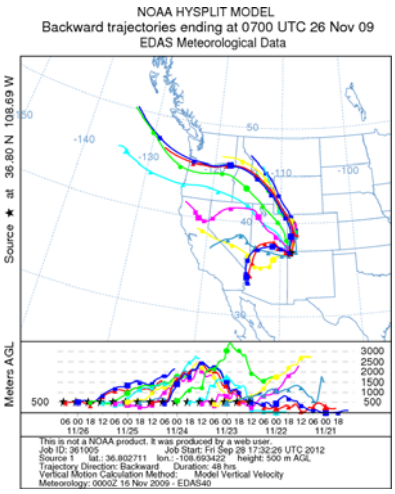
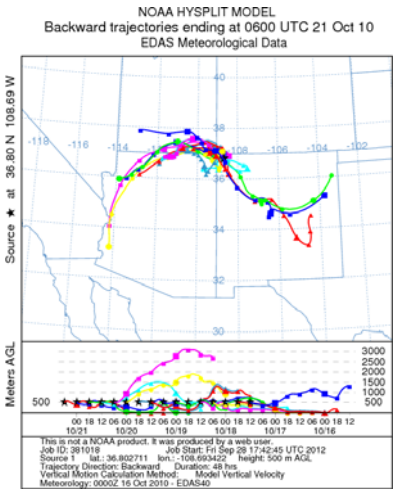


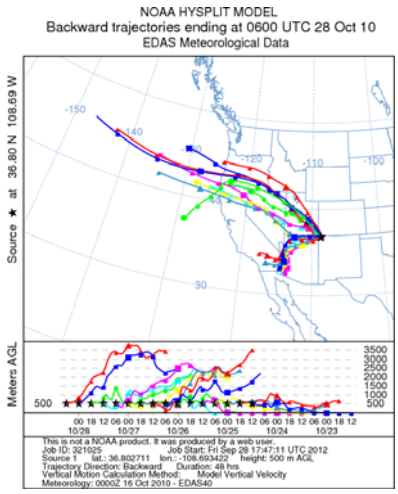
Sample 4 (Nov. 15–18, 2009)



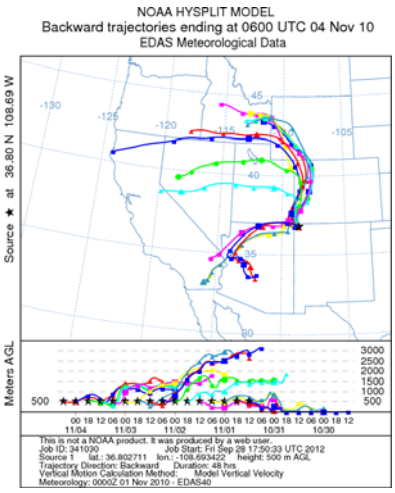
Sample 5 (Nov. 22–25, 2009)



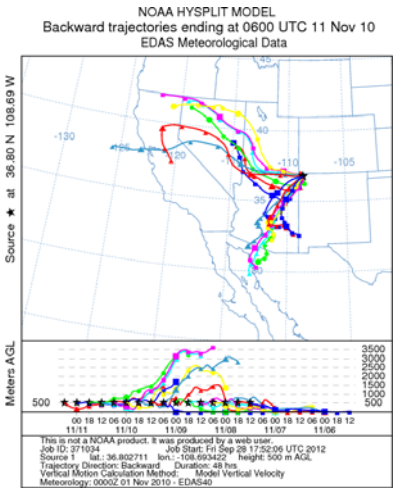
Sample 6 (Oct. 17–20, 2010)



Sample 7 (Oct. 24–27, 2010)

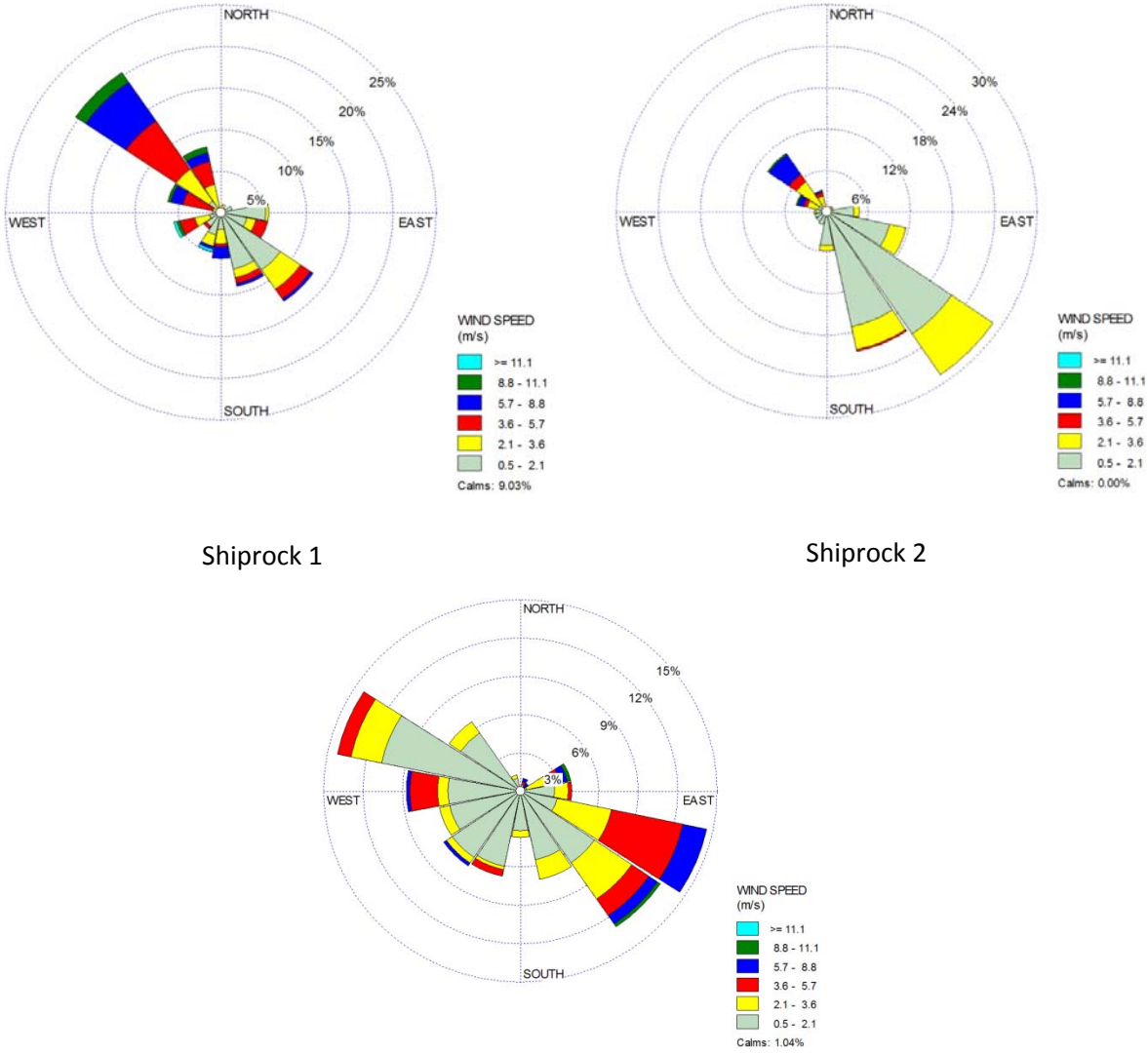


Sample 8 (Oct. 31–Nov. 3, 2010)



Sample 9 (Nov. 7–10, 2010)

Figure S1. HYSPLIT trajectories for nine samples.



Shiprock 1

Shiprock 2

Shiprock 3

Figure S2. Windrose diagrams for Shiprock samples 1–3.

References

Rudnick, R.L., Gao, S, 2005. Composition of the Continental Crust, in *The Crust—Treatise on Geochemistry,* edited by Rudnick R.L., Elsevier Ltd, Oxford, Vol. 3, pp. 1–64.