

Article

Sources of Particulate Matter in the Hunter Valley, New South Wales, Australia

Supplementary Materials

Table S1. Species included in Positive Matrix Factorisation (PMF) analysis of PM_{2.5} data from Newcastle, Beresfield, Mayfield, and Stockton listing PMF category, and the median concentration and signal-to-noise ratio calculated by EPA PMF 5.0 software at each site.

Species	PMF Strength	Newcastle		Beresfield		Mayfield		Stockton	
		Median (ng m ⁻³)	S/N	Median (ng m ⁻³)	S/N	Median n (ng m ⁻³)	S/N	Median n (ng m ⁻³)	S/N
Mass	Weak	5801.0	–	5485.0	–	6364.5	–	8095.0	–
H	Weak	132.3	10.00	158.5	10.00	148.9	10.00	169.7	9.99
Al	Strong	6.8	4.66	19.6	7.27	22.8	7.10	12.4	5.35
Si	Strong	40.1	9.56	73.1	9.99	72.6	9.90	50.5	9.54
Ti	Strong	1.3	4.20	1.9	5.25	2.2	5.66	1.3	3.68
V	Strong	2.3	5.20	0.6	1.64	1.7	4.66	5.0	7.30
Cr	Weak	0.1	0.36	0.3	1.60	0.3	0.98	0.1	0.25
Mn	Weak	0.8	3.98	1.5	5.44	2.2	6.30	1.0	4.16
Fe	Strong	33.7	9.95	77.8	10.00	71.8	10.00	31.8	9.85
Ni	Strong	1.0	3.30	0.3	0.85	0.8	2.37	1.9	4.81
Cu	Weak	1.0	3.89	1.0	3.17	1.7	4.81	0.7	2.44
Zn	Weak	3.2	6.22	5.0	7.33	7.9	7.89	4.7	6.52
Pb	Weak	1.7	1.21	1.8	1.10	2.5	1.29	1.7	1.00
Na ⁺	Strong	589.7	9.83	333.8	9.91	488.5	9.93	709.6	9.97
NH ₄ ⁺	Strong	117.8	9.97	132.2	10.00	122.4	10.00	198.2	10.00
K ⁺	Strong	43.3	5.77	38.6	6.24	41.7	6.13	51.9	7.09
Mg ²⁺	Strong	66.6	9.55	36.3	9.22	55.4	9.56	77.1	9.67
Ca ²⁺	Weak	34.1	8.62	30.1	6.64	43.3	7.50	44.0	9.05
Cl ⁻	Strong	471.6	9.31	203.5	8.60	359.6	8.92	718.5	9.86
Br	Weak	1.8	2.29	1.2	1.42	1.2	1.75	3.6	4.91
NO ₃ ⁻	Strong	252.8	10.00	199.0	10.00	232.2	10.00	464.5	10.00
SO ₄ ²⁻	Strong	852.3	9.97	713.3	10.00	765.8	10.00	1126.9	10.00
C ₂ O ₄ ²⁻	Weak	51.7	9.33	44.1	9.58	49.0	9.34	62.8	9.56
MSA ⁻	Strong	15.5	8.02	15.3	7.99	17.2	8.13	16.2	8.03
Levoglucosan	Strong	19.4	5.61	36.2	6.23	18.0	5.77	16.5	6.05
Mannosan	Strong	0.7	2.01	0.7	2.53	0.7	1.67	0.7	1.40
OC1	Weak	26.0	0.90	76.4	1.56	122.6	1.56	63.6	0.94
OC2	Weak	90.0	2.97	138.5	3.36	248.9	2.33	244.1	2.55
OC3	Weak	184.8	2.33	227.7	3.64	421.1	2.19	348.2	1.39
OC4	Weak	124.3	3.54	130.7	3.90	153.5	3.15	170.4	2.68
EC	Weak	194.7	3.66	290.3	3.93	463.2	3.36	374.2	3.01

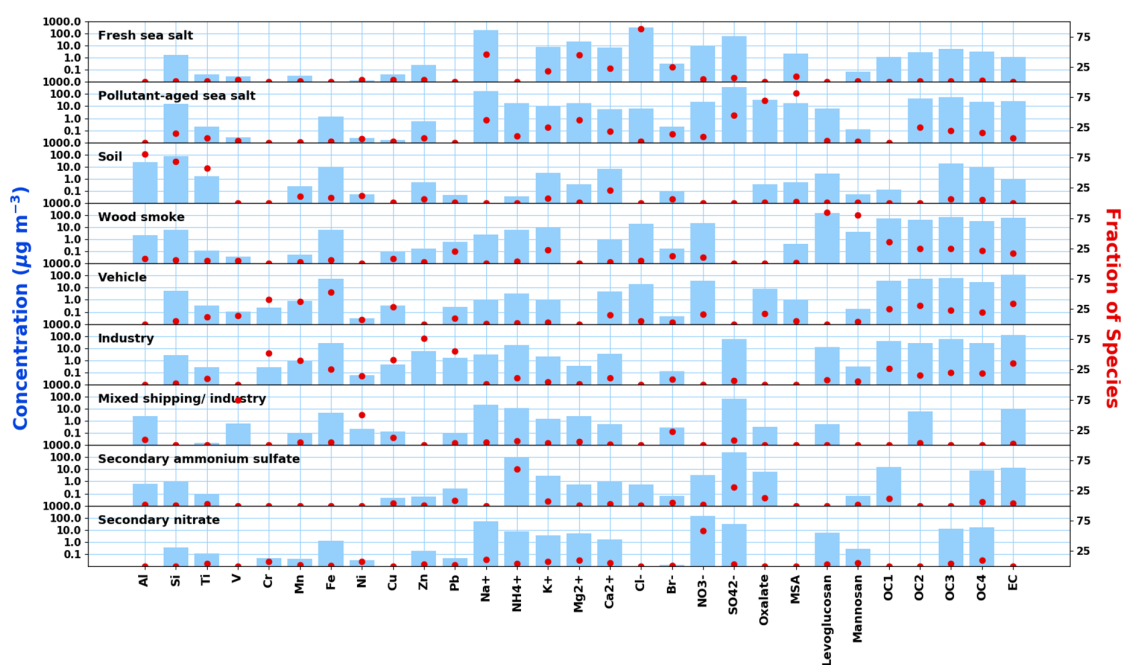
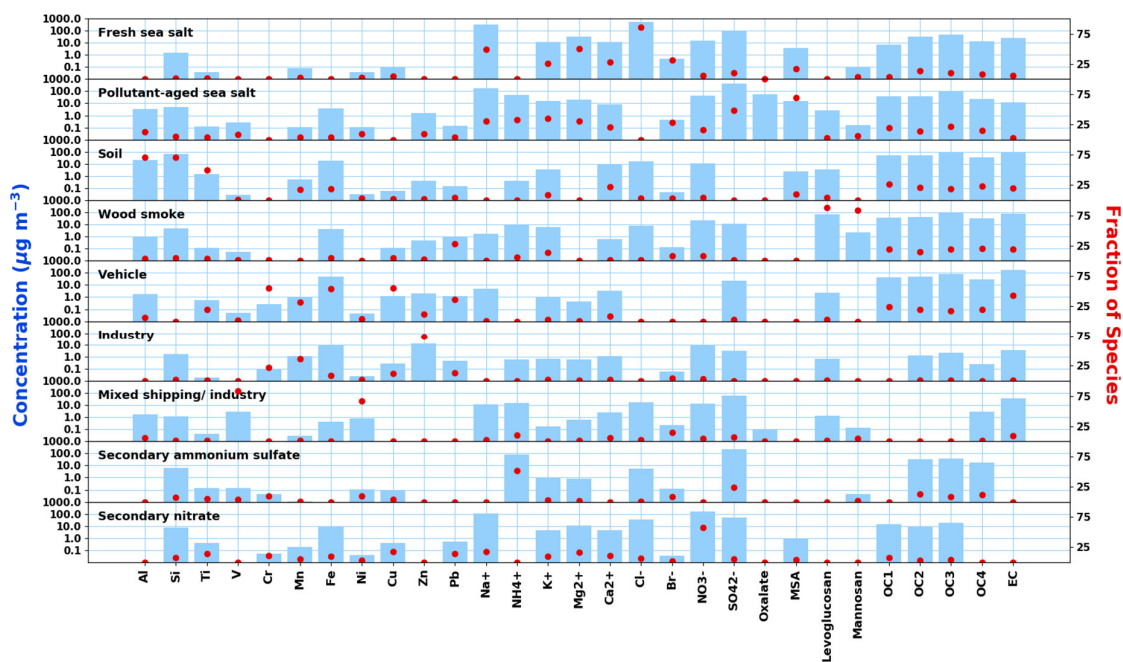
Table S2. Species included in PMF analysis of PM_{2.5-10} data for Mayfield and Stockton listing PMF category, and the median concentration and signal-to-noise ratio calculated by EPA PMF at each site.

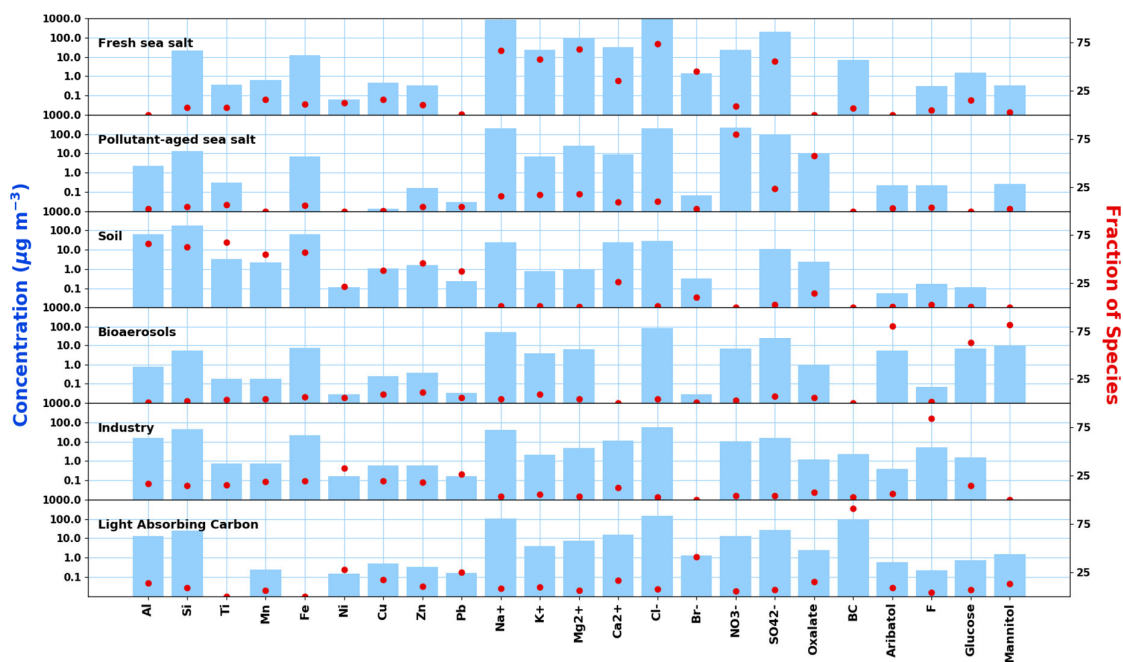
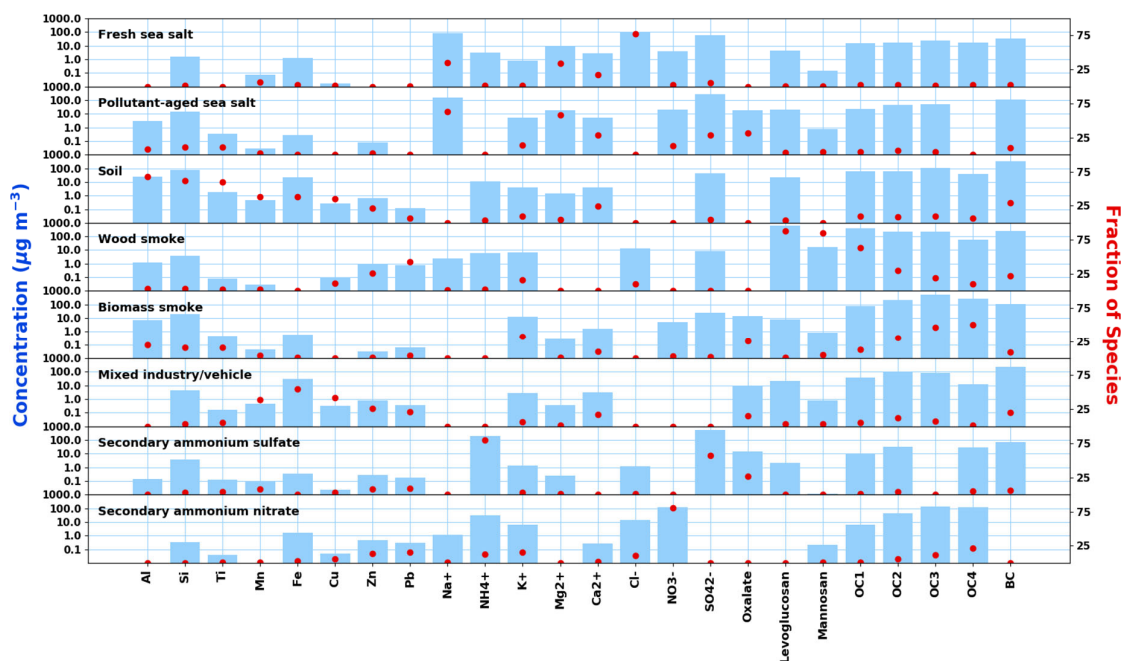
Species	PMF Strength	Mayfield		Stockton	
		Median (ng m ⁻³)	S/N	Median (ng m ⁻³)	S/N

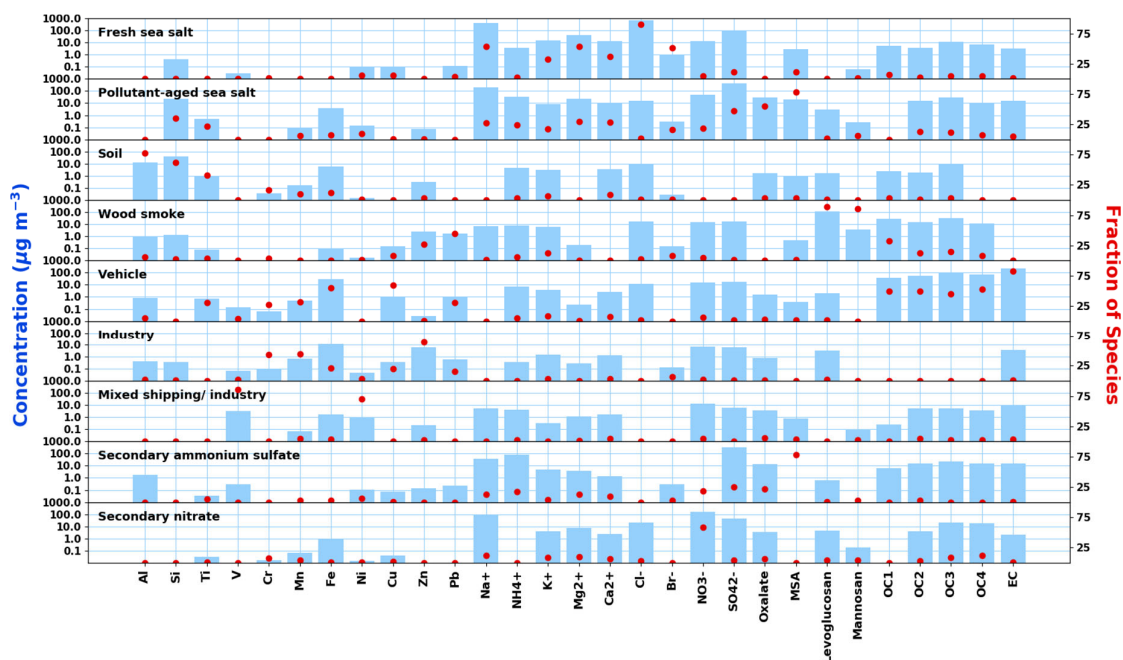
Mass	Weak	8136.5	–	20,981.0	–
Al	Strong	86.4	7.17	58.2	5.69
Si	Strong	228.3	7.90	283.1	7.89
Ti	Strong	4.3	3.60	3.2	3.05
Mn	Weak	3.7	4.98	3.1	3.98
Fe	Strong	112.9	7.88	82.1	7.83
Cu	Weak	3.6	5.38	3.0	4.24
Zn	Weak	3.9	5.38	3.3	4.82
Br	Weak	2.4	2.44	10.9	5.11
Pb	Weak	0.7	0.33	0.7	0.36
BC	Strong	825.5	6.05	1854.2	6.70
Na⁺	Strong	1130.4	9.32	3870.2	10.00
NH₄⁺	Weak	1.3	1.89	1.1	1.28
K⁺	Strong	38.1	3.34	136.2	6.53
Mg²⁺	Strong	122.9	8.04	450.7	9.49
Ca²⁺	Strong	91.1	5.94	211.4	8.52
Cl⁻	Strong	1646.6	9.39	6075.7	10.00
NO₃⁻	Strong	183.4	8.18	451.6	10.00
SO₄²⁻	Strong	364.9	9.54	1148.6	10.00
C₂O₄²⁻	Weak	14.3	7.37	23.3	8.95
F⁻	Weak	4.8	5.14	6.7	6.17
Arabitol	Strong	3.2	3.21	3.9	3.17
Mannitol	Strong	5.6	2.50	6.2	2.42

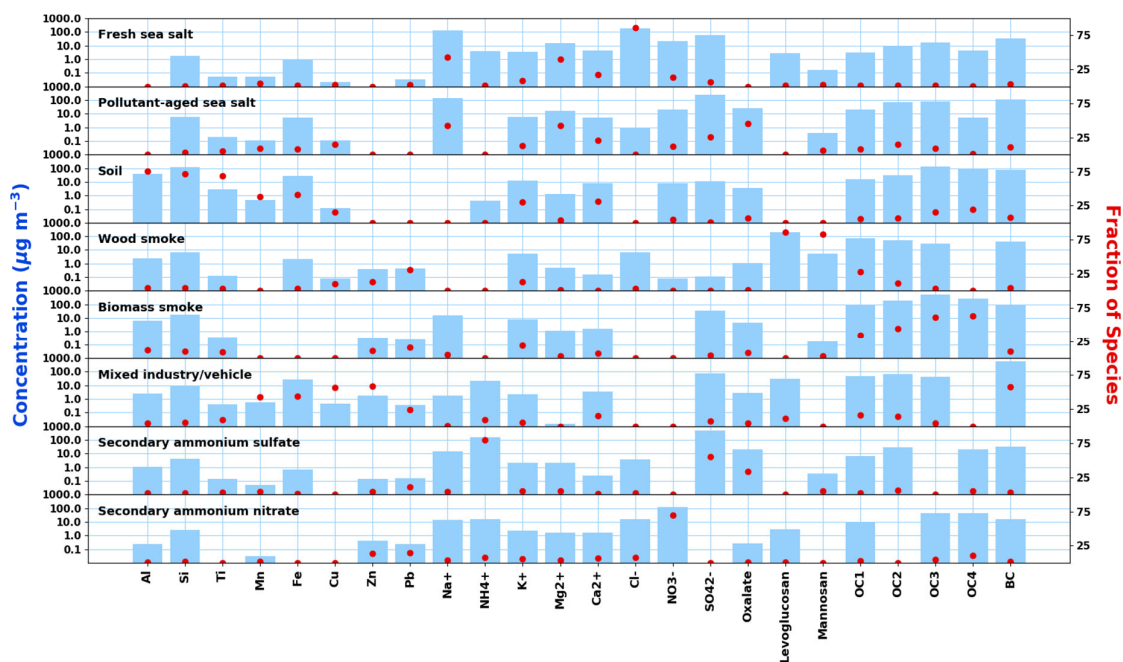
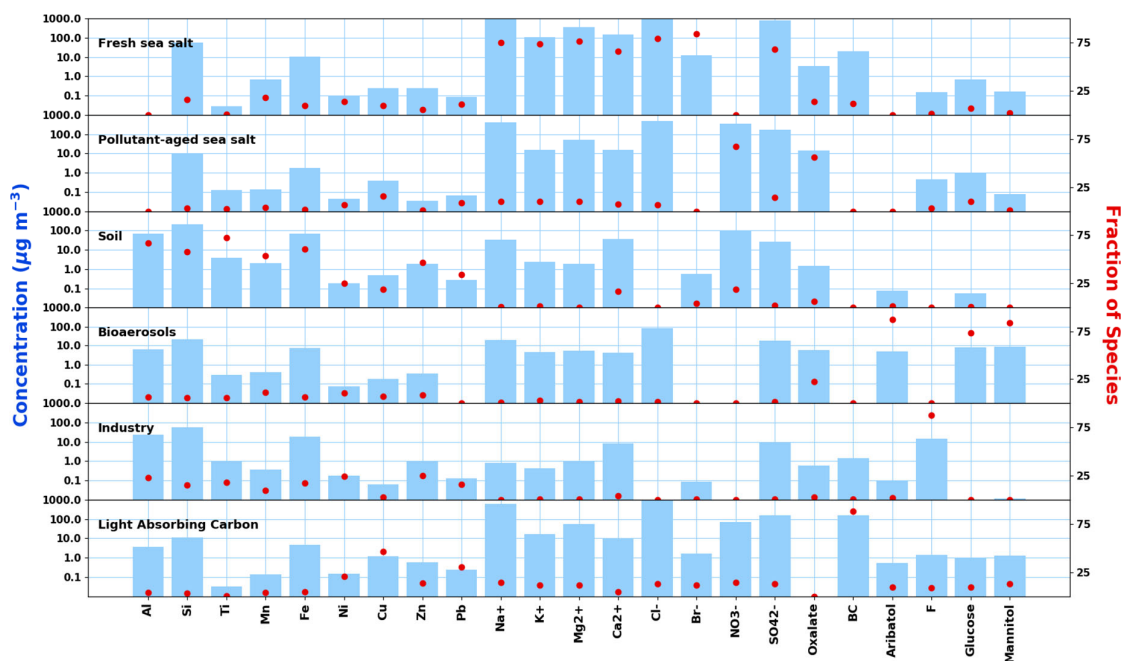
Table S3. Species included in PMF analysis of PM_{2.5} data from Singleton and Muswellbrook listing PMF category, and the median concentration and signal-to-noise ratio calculated by EPA PMF at each site.

Species	PMF Strength	Singleton		Muswellbrook	
		Median (ng m ⁻³)	S/N	Median (ng m ⁻³)	S/N
Na⁺	Strong	219	10.3	158	10.3
NH₄⁺	Strong	141	11.3	204	11
Mg²⁺	Strong	26	9.9	20.5	9.9
Cl⁻	Strong	46	18	64	11.9
NO₃⁻	Strong	126	15.1	120	10.9
SO₄²⁻	Strong	765	12.7	846	12.7
C₂O₄²⁻	Strong	53	9.8	50	9.8
Levoglucosan	Strong	48.5	19	82	17.4
Mannosan	Strong	1.3	7.9	2.6	15.1
Al	Strong	45	14.8	33	13.2
Si	Strong	143	16.1	118	16
K	Strong	37	15.9	40	14.1
Ca	Strong	23	14.9	16	14.3
Ti	Strong	3.4	10.3	3	7.8
Fe	Strong	53	15.8	46	15.7
BC	Strong	857	12	1046	12
OC1	Strong	223	12.5	325	17.8
OC2	Strong	397	10.6	618	14
OC3	Strong	821	13.7	1142	15.1
OC4	Strong	409	18.9	567	18.9
Mn	Strong	1.1	6	1.1	6.4
Cu	Strong	0.6	3.8	0.6	4.3
Zn	Strong	3	7.7	2.8	9.8
Pb	Weak	1.4	1.2	1.2	1.8
Mass	Weak Total Variable	6108	0.8	7081	0.8

Figure S1. PMF factor fingerprints for PM_{2.5} at Beresfield.Figure S2. PMF factor fingerprints for PM_{2.5} at Mayfield.

Figure S3. PMF factor fingerprints for $PM_{2.5-10}$ at Mayfield.Figure S4. PMF factor fingerprints for $PM_{2.5}$ at Muswellbrook.

Figure S5. PMF factor fingerprints for PM_{2.5} at Newcastle.Figure S6. PMF factor fingerprints for PM_{2.5} at Singleton.

Figure S7. PMF factor fingerprints for PM_{2.5} at Stockton.Figure S8. PMF factor fingerprints for PM_{2.5-10} at Stockton.