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Supplementary material

Source identification of atmospheric particle-bound metals at Terra Nova Bay, Antarctica

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Table S1. Inductively coupled plasma–atomic emission spectroscopy instrumental parameters

Instrument	Varian Inc. (Palo Alto, CA, USA) Vista PRO
Nebuliser	Pneumatic concentric (K-style)
Spray chamber	Cyclonic
Plasma source configuration	Axial
RF Power	1100 W
Plasma gas flow rate	15.0 L min^{-1}
Auxiliary gas flow rate	1.5 L min^{-1}
Nebuliser gas flow rate	0.75 L min^{-1}
Sample uptake rate	0.78 mL min^{-1}
Internal standard uptake rate	0.22 mL min^{-1}
Integration time	15 s
Replicates	7
Analytes and wavelengths (nm)	Al (236.705; 237.312; 396.152)
	Fe (234.350; 240.489; 258.588)
	Lu (291.139)[A]
	Mg (279.800; 285.213; 293.651)
	Na (568.821; 588.995; 589.592)

[A]Internal standard.

Table S2. Inductively coupled plasma–mass spectrometry instrumental parameters

Instrument	Perkin–Elmer (Waltham, MA, USA) Elan DRC II
Nebuliser	PFA-ST microconcentric
Spray chamber	Low-volume cyclonic (cinnabar)
RF Power	1500 W
Plasma gas flow rate	14.5 L min^{-1}
Auxiliary gas flow rate	1.65 L min^{-1}
Nebuliser gas flow rate	0.95 L min^{-1}
Sample uptake rate	150 μL min^{-1}
RF amplitude	150 V
Axial field voltage	300 V
Cell path voltage	–28 V
Cell rod offset	–8.0 V
Mass analyser rod offset	0.0 V
Stability parameters[A]	RPa = 0.0; RPq = 0.25
Dwell time	50 ms
Sweeps	20
Replicates	5
Measured ions	$^{7}Li^{+}$, $^{51}V^{+}$, $^{52}Cr^{+}$, $^{55}Mn^{+}$, $^{59}Co^{+}$, $^{63}Cu^{+}$, $^{85}Rb^{+}$, $^{89}Y^{+}$, $^{98}Mo^{+}$, $^{208}Pb^{+}$, $^{115}In^{+}$ [B]

[A]Mathieu stability parameters of the cells quadrupole: a = 1.9 × RPa; q = 0.95 × RPq;

[B]Internal standard.

Table S3. Field blanks and limits of detection

Stage (µm)	Major elements (ng m^{-3})				Trace elements (pg m^{-3})									
	Al	Fe	Mg	Na	Co	Cu	Li	Mn	Mo	Pb	Rb	Y	Cr	V
Field blanks														
10–7.2	1.26	0.17	0.05	43.3	0.34	2.16	0.08	2.43	0.48	1.50	0.26	0.44	14.0	0.50
7.2–3.0	1.21	0.17	0.05	43.2	0.38	2.60	0.06	3.47	0.41	0.65	0.31	0.47	17.9	0.35
3.0–1.5	1.21	0.17	0.06	43.5	0.36	3.13	0.08	2.77	0.61	0.62	0.23	0.47	16.5	0.43
1.5–0.95	1.21	0.17	0.07	43.5	0.39	2.63	0.10	3.07	0.41	0.73	0.29	0.46	14.3	0.36
0.95–0.49	1.42	0.17	0.09	43.5	0.38	3.01	0.17	2.36	0.40	0.48	0.28	0.49	16.5	0.38
Limits of detection														
10–7.2	0.17	0.30	0.22	2.06	0.05	0.20	0.05	1.53	0.10	0.20	0.10	0.03	2.88	0.34
7.2–3.0	0.04	0.30	0.22	2.14	0.01	2.70	0.03	4.64	0.08	0.15	0.09	0.05	6.86	0.04
3.0–1.5	0.08	0.30	0.22	1.96	0.25	6.34	0.04	4.17	0.50	0.26	0.18	0.22	2.15	0.11
1.5–0.95	0.01	0.30	0.21	2.02	0.01	2.23	0.04	4.45	0.03	0.29	0.10	0.01	0.76	0.04
0.95–0.49	0.04	0.29	0.20	2.08	0.05	1.28	0.25	1.72	0.03	0.10	0.05	0.01	1.68	0.15

Table S4. Analysis of CRM-MURST-ISS-A1 (Antarctic sediment)

Values are averages and 95 % confidence intervals, indicative values within parentheses

Element	Unit	Measured	Certified
Al	%	6.45 ± 0.08	6.71 ± 0.33
Co	µg g^{-1}	6.76 ± 0.76	6.87 ± 0.31
Cr	µg g^{-1}	46.9 ± 3.5	42.1 ± 3.4
Cu	µg g^{-1}	5.97 ± 1.01	(5.79 ± 1.59)
Fe	%	2.34 ± 0.13	2.44 ± 0.07
Mg	%	0.96 ± 0.04	(1.52 ± 0.13)
Mn	µg g^{-1}	437 ± 43	446 ± 19
Mo	µg g^{-1}	0.9 ± 0.7	(1.1 ± 0.6)
Na	%	2.20 ± 0.16	(2.27 ± 0.06)
Pb	µg g^{-1}	20.5 ± 1.7	21.0 ± 2.9
Rb	µg g^{-1}	123.4 ± 9.2	(124.8 ± 5.1)
Y	µg g^{-1}	18.5 ± 2.4	(19.1 ± 2.5)
V	µg g^{-1}	51.6 ± 9.9	(51.8 ± 2.2)

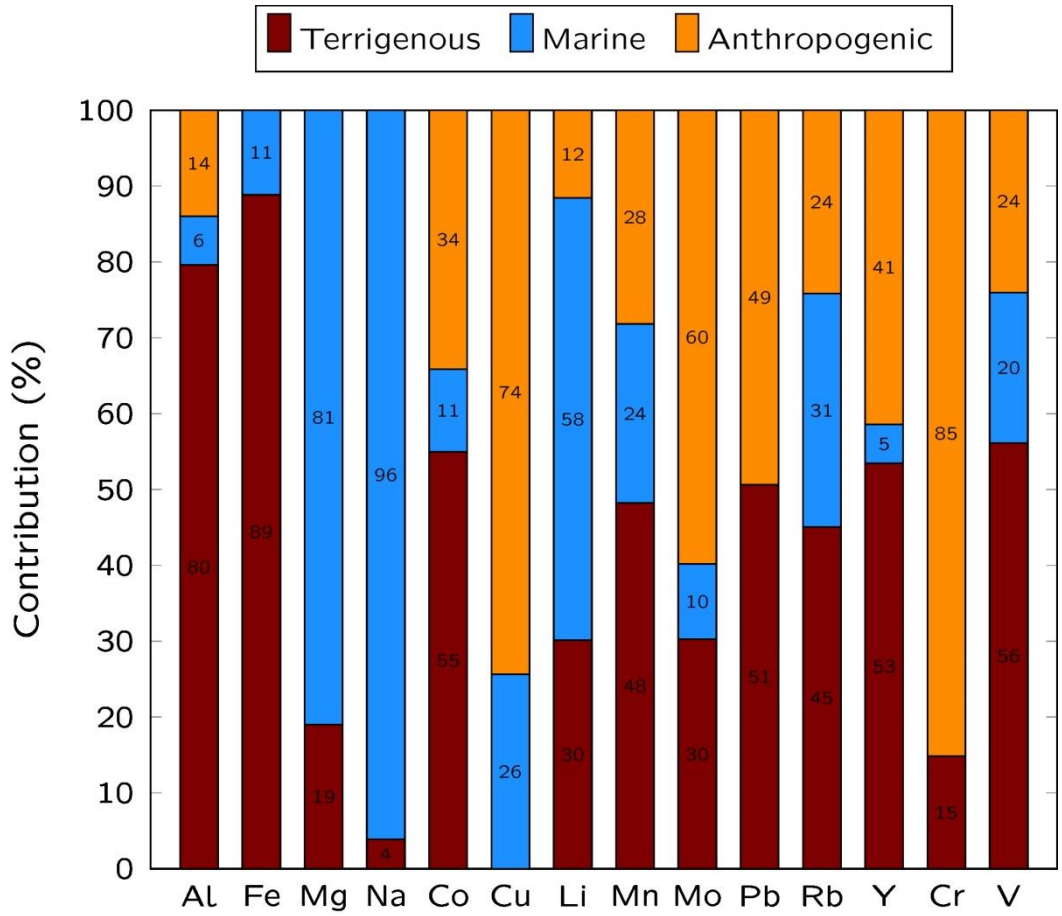

Fig. S1. Factor profiles from positive matrix factorisation (PMF) analysis. Values are percentage contribution of each factor.