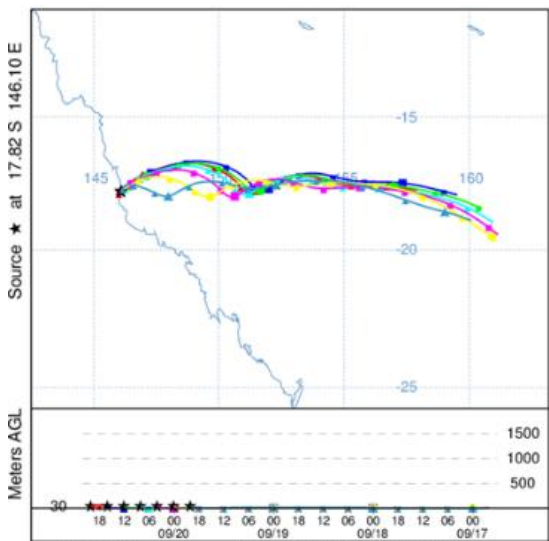


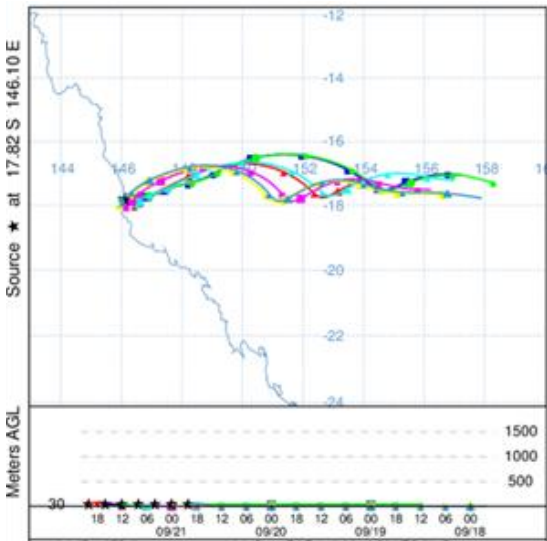
Supplementary Materials: Atmospheric Trace Metal Deposition near the Great Barrier Reef, Australia

Michal Strzelec, Bernadette C. Proemse, Melanie Gault-Ringold, Philip W. Boyd, Morgane M. G. Perron, Robyn Schofield, Robert G. Ryan, Zoran D. Ristovski, Joel Alroe, Ruhi S. Humphries, Melita D. Keywood, Jason Ward and Andrew R. Bowie

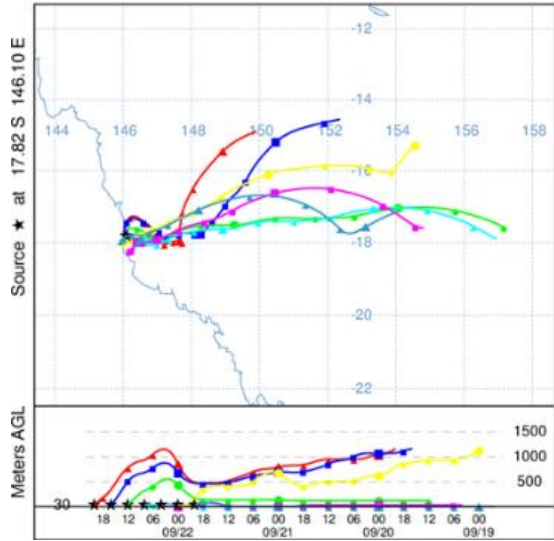
marine 1 (MB3)



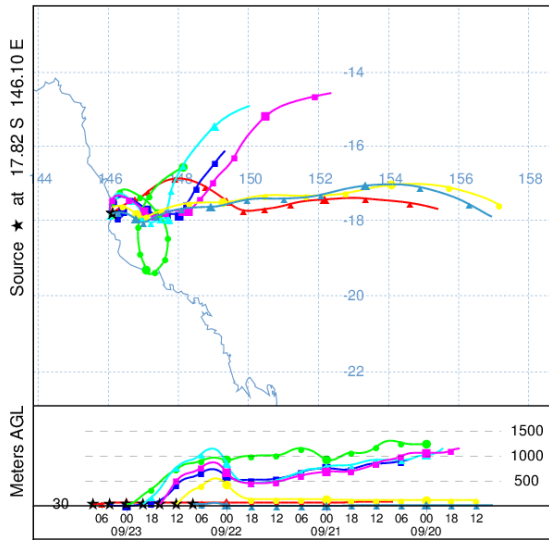
marine 2 (MB4)



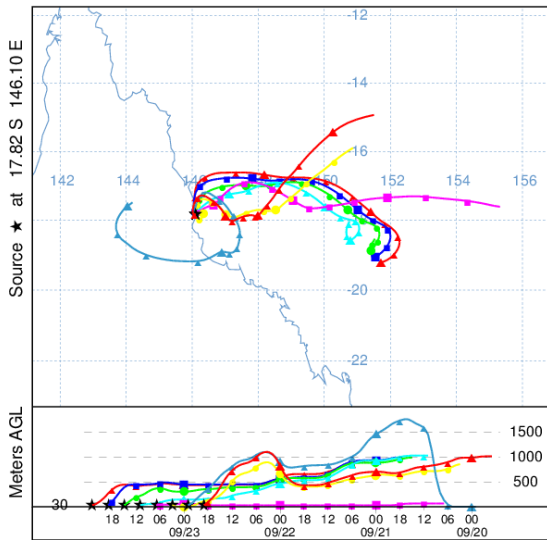
marine 3 (MB5)



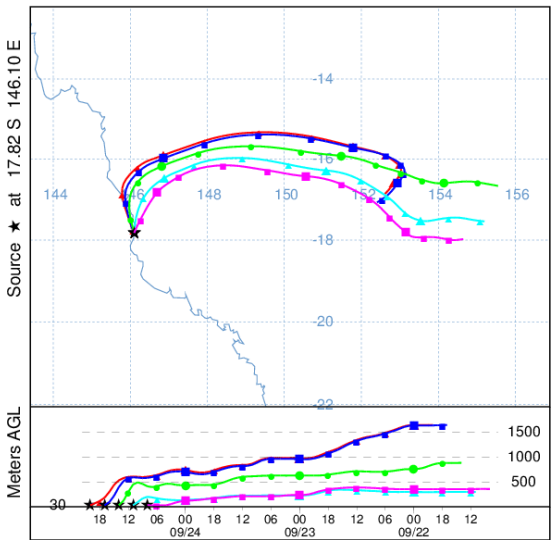
marine 4 (MB6)



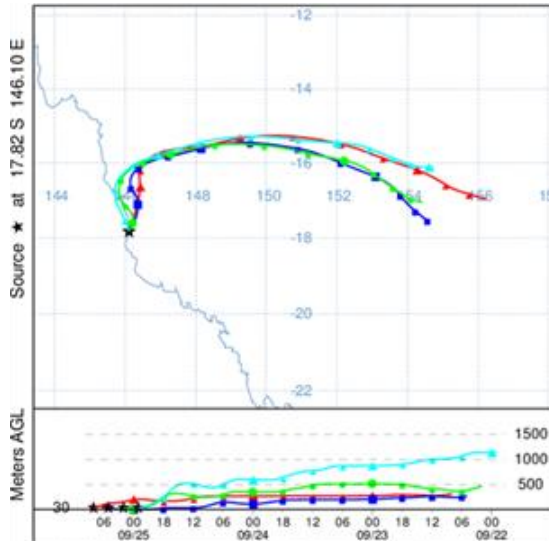
marine 5 (MB7)



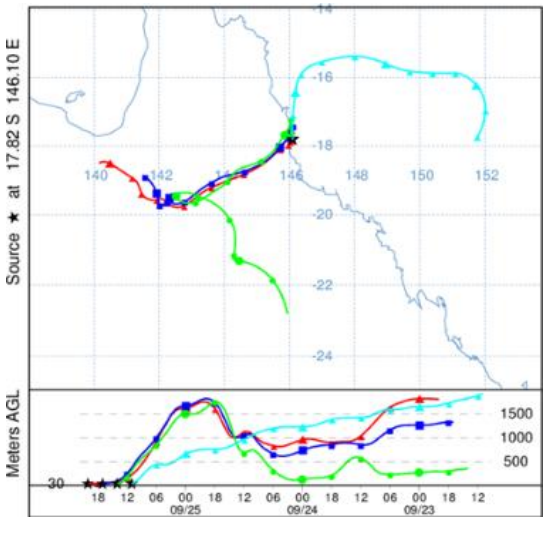
marine 6 (MB9)



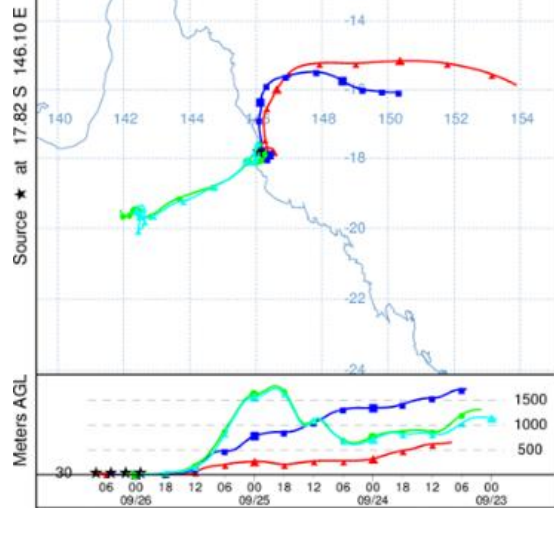
marine 7 (MB10)



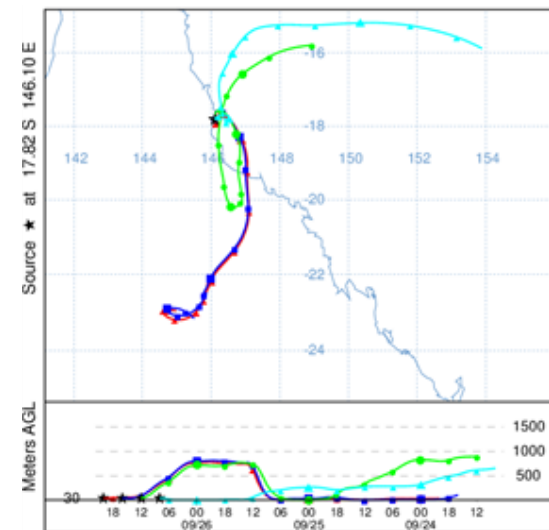
terrestrial 1 (MB11)



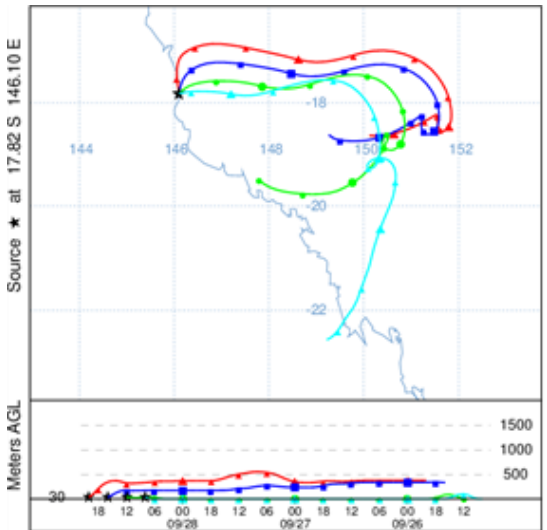
terrestrial 2 (MB12)



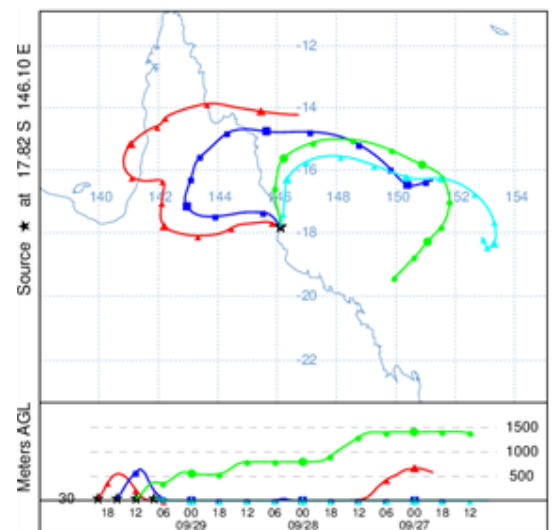
terrestrial 3 (MB13)



land sea land 1(MB17)



terrestrial 4 (MB18A)



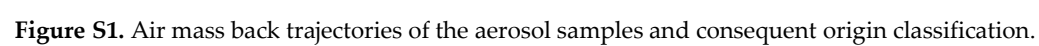


Table S1. Dry deposition aerosol samples log sheet. Measured volume was corrected to the temperature and pressure conditions.

Sample ID	Start (UTC)	End (UTC)	Total time (min)	Corrected volume (m ³)
MB03	21:02 19/09/16	20:32 20/09/16	1409	1448.5
MB04	20:47 20/09/16	20:08 21/09/16	1401	1435.9
MB05	20:22 21/09/16	20:30 22/09/16	1447	1489.9
MB06	22:33 22/09/16	08:28 23/09/16	595	605.6
MB07	8:35 23/09/16	23:09 23/09/16	873	899.0
MB09	08:03 24/09/16	20:30 24/09/16	747	769.5
MB10	21:44 24/09/16	07:51 25/09/16	607	615.7
MB11	08:03 25/09/16	20:32 25/09/16	749	770.3
MB12	20:45 25/09/16	08:03 26/09/16	678	689.0
MB13	08:11 26/09/16	20:26 26/09/16	735	757.3
MB17	08:12 28/09/16	20:09 28/09/16	717	736.6
MB18A	07:55 29/09/16	20:15 29/09/16	740	759.3
MB18	20:27 29/09/16	07:52 30/09/16	685	692.4
MB19	08:00 30/09/16	20:24 30/09/16	744	761.0
MB20	20:35 30/09/16	07:56 01/10/16	678	690.5
MB23	08:19 04/10/16	20:12 04/10/16	714	754.9
MB24	20:12 04/10/16	07:49 05/10/16	686	688.5
MB25	07:57 05/10/16	19:51 05/10/16	715	740.6

Table S2. Classification of aerosol samples based on their origin.

Origin Classification	Aerosol Origin	Samples
Back Trajectories	Marine	MB3, MB4, MB5, MB6, MB7, MB9, MB10
	Terrestrial	MB11, MB12, MB13, MB18A, MB18, MB20
	Mixed (marine and terrestrial)	MB19
	Terrestrial transported over the sea	MB17, MB23, MB24, MB25
Wind direction	Sea breeze	MB6, MB10, MB12, MB20, MB23, MB24, MB25
	Land breeze	MB7, MB9, MB11, MB17, MB18A, MB19
	Mixed breeze	MB3, MB4, MB5, MB13, MB18

Table S3. Fractional solubility, atmospheric concentration and dry deposition flux of Fe.

	MB3	MB4	MB5	MB6	MB7	MB9	MB10	MB11	MB12	MB13	MB17	MB18A	MB18	MB19	MB20	MB23	MB24	MB25	min	max	avg	sd	rsd	
Fractional solubility (%)																								
soluble	4.9	9.3	8.1	9.6	4.0	3.8	5.2	7.1	4.3	7.8	6.8	4.5	6.0	5.2	4.6	3.4	3.3	3.5	3.3	9.6	5.6	2.0	35.9	
leachable	1.5	2.1	2.5	1.9	1.8	3.3	3.3	2.7	3.9	2.6	1.6	3.4	2.7	2.2	1.8	1.8	1.7	1.8	1.5	3.9	2.4	0.7	30.5	
labile	6.4	11.4	10.6	11.4	5.8	7.1	8.5	9.8	8.2	10.4	8.4	7.9	8.7	7.4	6.4	5.3	4.9	5.3	4.9	11.4	8.0	2.1	26.2	
Atmospheric concentration (ng m ⁻³)																								
soluble	1.8	3.4	2.4	3.5	3.1	4.3	5.9	4.0	4.9	4.1	8.4	5.8	6.1	4.7	2.3	6.5	6.9	5.1	1.8	8.4	4.6	1.8	38.1	
leachable	0.5	0.8	0.7	0.7	1.4	3.7	3.7	1.5	4.4	1.4	1.9	4.4	2.7	2.0	0.9	3.5	3.6	2.7	0.5	4.4	2.3	1.4	60.5	
labile	2.3	4.2	3.1	4.1	4.5	8.1	9.6	5.6	9.4	5.5	10.3	10.3	8.8	6.7	3.2	10.1	10.6	7.7	2.3	10.6	6.9	2.9	41.5	
refractory	33.7	32.3	25.9	32.1	72.9	105.1	102.9	51.7	104.9	47.2	112.4	120.5	93.1	83.7	47.4	181.6	203.2	138.4	25.9	203.2	88.3	51.4	58.2	
total	36.0	36.5	29.0	36.2	77.4	113.2	112.5	57.3	114.3	52.7	122.6	130.7	101.9	90.5	50.6	191.7	213.7	146.1	29.0	213.7	95.2	53.9	56.6	
Dry deposition flux (μmol m ⁻² day ⁻¹)																								
soluble	0.055	0.105	0.073	0.107	0.096	0.134	0.182	0.125	0.153	0.127	0.258	0.181	0.189	0.146	0.073	0.202	0.215	0.157	0.055	0.258	0.143	0.055	38.094	
leachable	0.017	0.023	0.023	0.021	0.044	0.116	0.114	0.048	0.138	0.042	0.059	0.137	0.084	0.062	0.028	0.110	0.112	0.082	0.017	0.138	0.070	0.042	60.532	
labile	0.071	0.129	0.095	0.128	0.140	0.250	0.296	0.173	0.291	0.169	0.317	0.318	0.273	0.208	0.100	0.312	0.327	0.239	0.071	0.327	0.213	0.088	41.503	
refractory	1.043	1.000	0.802	0.993	2.256	3.252	3.184	1.599	3.247	1.461	3.477	3.728	2.881	2.590	1.467	5.619	6.286	4.282	0.802	6.286	2.731	1.591	58.244	
total	1.114	1.129	0.897	1.121	2.396	3.502	3.480	1.772	3.538	1.630	3.794	4.046	3.153	2.799	1.567	5.931	6.613	4.522	0.897	6.613	2.945	1.668	56.633	

Table 4. Mean (± SD) values of total atmospheric concentration, labile fraction, and dry deposition flux of bioactive elements.

Element	Unit	Mean	SD
V	total (ng m ⁻³)	1.17	0.45
	labile (%)	73.7	14.0
	labile (nmol m ⁻² day ⁻¹)	3.01	1.50
Mn	total (ng m ⁻³)	2.58	1.22
	labile (%)	60.9	9.4
	labile (nmol m ⁻² day ⁻¹)	50.8	25.3
Co	total (ng m ⁻³)	0.0419	0.0198
	labile (%)	47.5	10.5
	labile (nmol m ⁻² day ⁻¹)	0.307	0.153
Cu	total (ng m ⁻³)	1.54	1.63
	labile (%)	52.6	23.2
	labile (nmol m ⁻² day ⁻¹)	1.74	0.87
Zn	total (ng m ⁻³)	3.50	2.15
	labile (%)	84.6	19.5
	labile (nmol m ⁻² day ⁻¹)	7.93	3.97
Mo	total (ng m ⁻³)	0.0469	0.0313
	labile (%)	44.7	6.4
	labile (nmol m ⁻² day ⁻¹)	0.0385	0.0193
Cd	total (ng m ⁻³)	0.069	0.108
	labile (%)	96.7	4.0
	labile (nmol m ⁻² day ⁻¹)	0.106	0.053
Pb	total (ng m ⁻³)	0.329	0.163
	labile (%)	74.2	8.9
	labile (nmol m ⁻² day ⁻¹)	0.211	0.105