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Supplement of

Dry season aerosol iron solubility in tropical northern Australia

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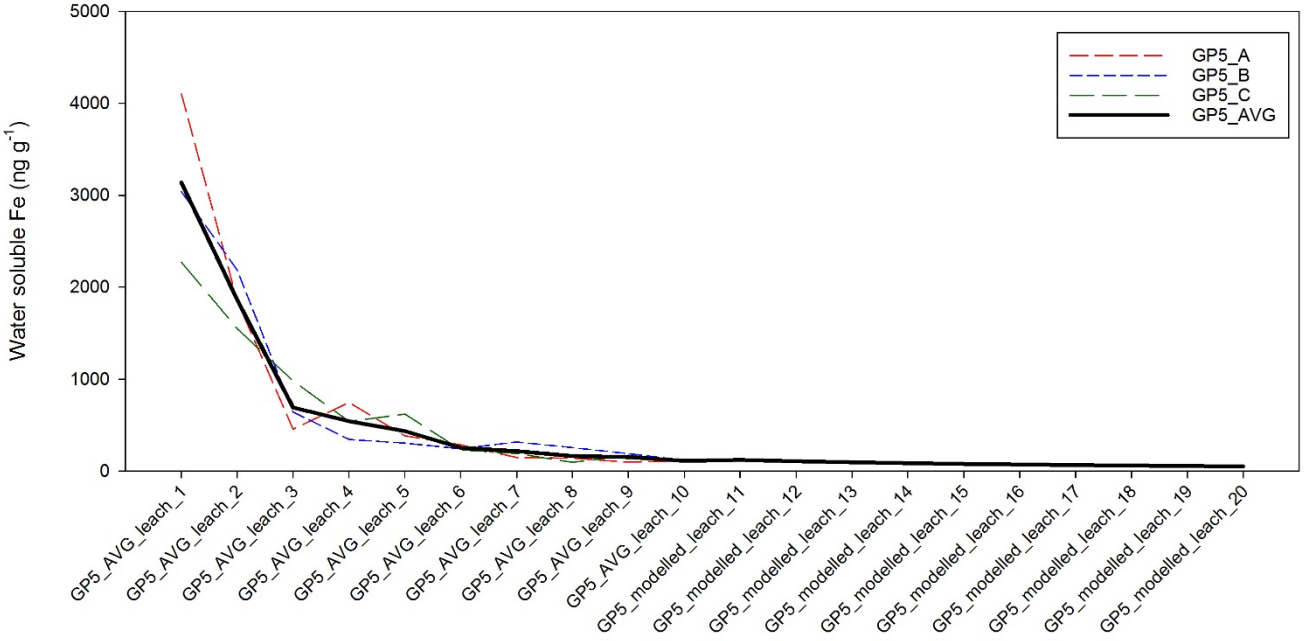

Figure S1: Sequential ultra-pure water leaches of three aliquots (A-C) of GP5. Each filter punch was leached with 10 passes of 50 mL ultra-pure water. Black line indicates the mean soluble iron concentration of the three aliquots. Leaches 11-20 were estimated by fitting a power law curve to the average water soluble iron concentrations of the GP5 sample.

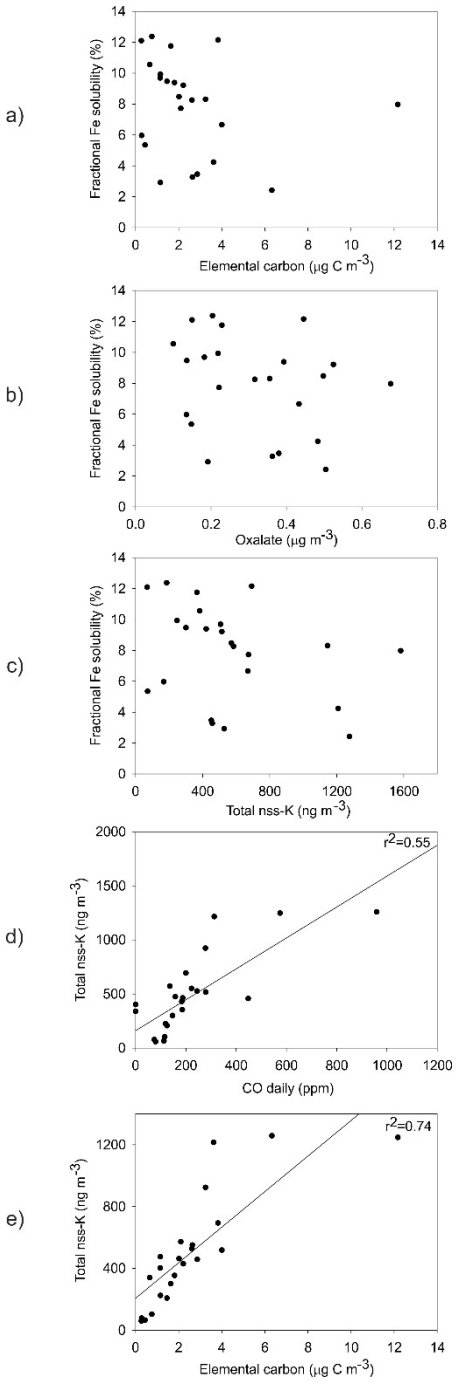

Figure S2: Scatterplots of a) fractional Fe solubility versus elemental carbon concentration, b) fractional Fe solubility versus oxalate concentration, c) fractional Fe solubility versus nss-K concentration, d) nss-K concentration versus CO concentration, e) nss-K concentration versus elemental carbon concentration.

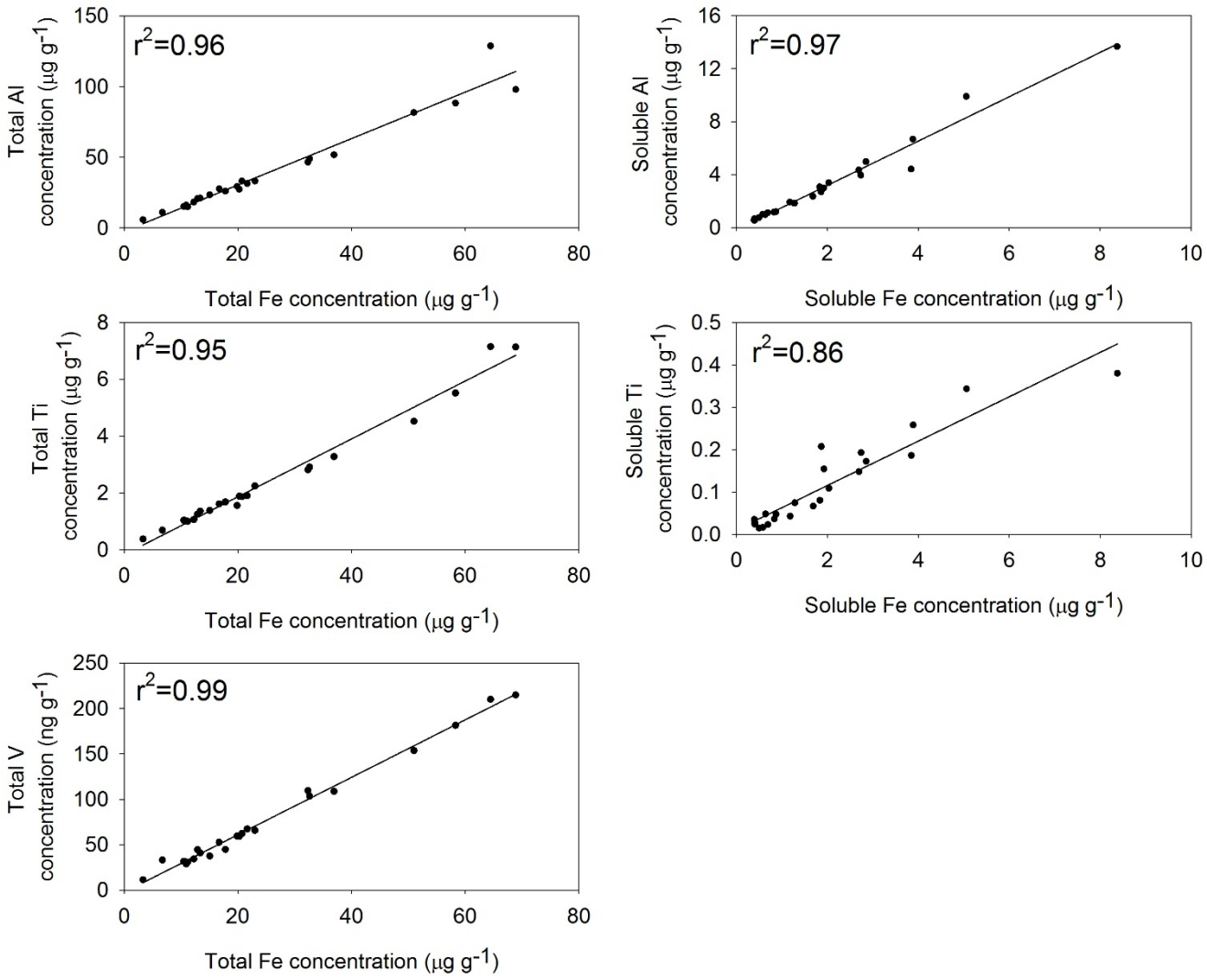

Figure S3: Scatterplots of total and soluble Fe, Al, Ti and V concentrations of aerosols from the Gunn Point campaign.

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Table S1:Trace metal aerosol samples (PM10) collected at Gunn Point, dry season 2014.

Sample time	[a]Start date/ time	[a]Finish date/ time	Total sampling duration (min)	[b]Total air volume (m^3)	[c]Total air volume (m^3)
GP1	4/06/2014 11:05	5/06/2014 10:45	1117	1102	1122
GP2	5/06/2014 11:10	6/06/2014 12:30	1498	1458	1490
GP3	6/06/2014 12:55	7/06/2014 11:30	1355	1531	1572
GP4	7/06/2014 11:54	8/06/2014 8:47	1253	1416	1445
GP5	8/06/2014 9:08	9/06/2014 10:21	1512	1708	1715
GP6	9/06/2014 10:42	[d]10/06/2014	711	802	806
GP7	10/06/2014 2:41	11/06/2014 9:25	1112	1256	1278
GP8	11/06/2014 10:16	12/06/2014 10:43	1467	1658	1669
GP9	12/06/2014 11:03	13/06/2014 9:04	1322	1494	1518
GP10	13/06/2014 10:02	14/06/2014 10:56	1494	1688	1729
GP11	14/06/2014 11:31	15/06/2014 10:29	1378	1556	1584
GP12	15/06/2014 11:11	16/06/2014 10:16	1385	1565	1572
GP13	16/05/2014 10:45	17/06/2014 9:39	1374	1552	1550
GP14	17/06/2014 10:04	18/06/2014 10:18	1454	1643	1635
GP14	17/06/2014 10:04	18/06/2014 10:18	1454	1643	1635
GP15	18/06/2014 11:16	19/06/2014 10:15	1379	1559	1577
GP16	19/06/2014 10:41	20/06/2014 9:36	1375	1554	1584
GP17	20/06/2014 9:59	21/06/2014 9:58	1439	1626	1647
GP18	21/06/2014 10:31	22/06/2014 8:31	1319	1490	1508
GP19	22/06/2014 8:55	23/06/2014 9:32	1476	1668	1669
GP20	23/06/2014 10:39	24/06/2014 9:37	[c]1269	1429	1441
GP21	24/06/2014 10:04	25/06/2014 9:11	1387	1567	1569
GP22	25/06/2014 9:42	26/06/2014 9:05	1403	1499	1497
GP23	26/06/2014 9:46	27/06/2014 8:27	1360	1537	1536

[a]Australian Central Standard Time

[b]Total air volume calculated using STP.

[c]Total air volume corrected to ambient temperature and pressure.

[d]Fuse blown.

Table S2: Recovery rates of total trace metals in certified reference materials (CRM; MESS-3 marine sediment (MESS-3; National Research Council, Canada), and QC-TMFM-A spiked trace metals on nitrocellulose filter (TMF; High Purity Standards).

CRM recovery %	Al	±	K	±	Ti	±	V	±	Cr	±	Mn	±	Fe	±	As	±	Pb	±
MESS-3	112	8	101	15	92	9	100	9	97	10	97	11	108	8	95	11	103	11
TMF	n/d		n/d		n/d		101	8	102	9	100	9	99	7	91	7	107	8

Table S3: Instrument conditions and measurement parameters.

Instrument	HR-ICP-MS, Element XR (Thermo Fisher, Germany)	
Torch	Precision type, quartz o-ring free, PFA injector (Element Scientific Inc.)	
Spray chamber	PC^3 chilled cyclonic spray chamber (ESI)	
Nebuliser	ST micro centric PFA (ESI)	
RF power (W)	~1350	
Cool gas flow (L min^{-1})	~16	
Auxiliary gas flow (L min^{-1})	~0.9	
Sample gas flow (L min^{-1})	~0.9	
Additional gas (L min^{-1})	~0.4 Ar	
Guard electrode	Activated	
Sample uptake	96 s (Seafast II pump auto-sampler with fast 3 sample injection valve)	
Pump speed during wash	10 rpm	
Scan type	E-scan	
Elements monitored in low resolution ($m/\Delta m$ ~400)	Mo, Pb	
Elements monitored in medium resolution ($m/\Delta m$ ~4000)	Na, Mg, Al, Ti, V ,Cr, Mn, Fe	
Elements monitored in high resolution ($m/\Delta m$ ~4000)	K, As	
	Soluble	**Digest**
Sample rinse	50 s, 3 % HCl (ultra-pure)	50 s, 3 % HNO_3 (ultra-pure)
Internal standard	1.5 ppb In, 5 % HCl (ultra-pure)	1.5 ppb In, 3 % HNO_3 (ultra-pure)