



Supplement of

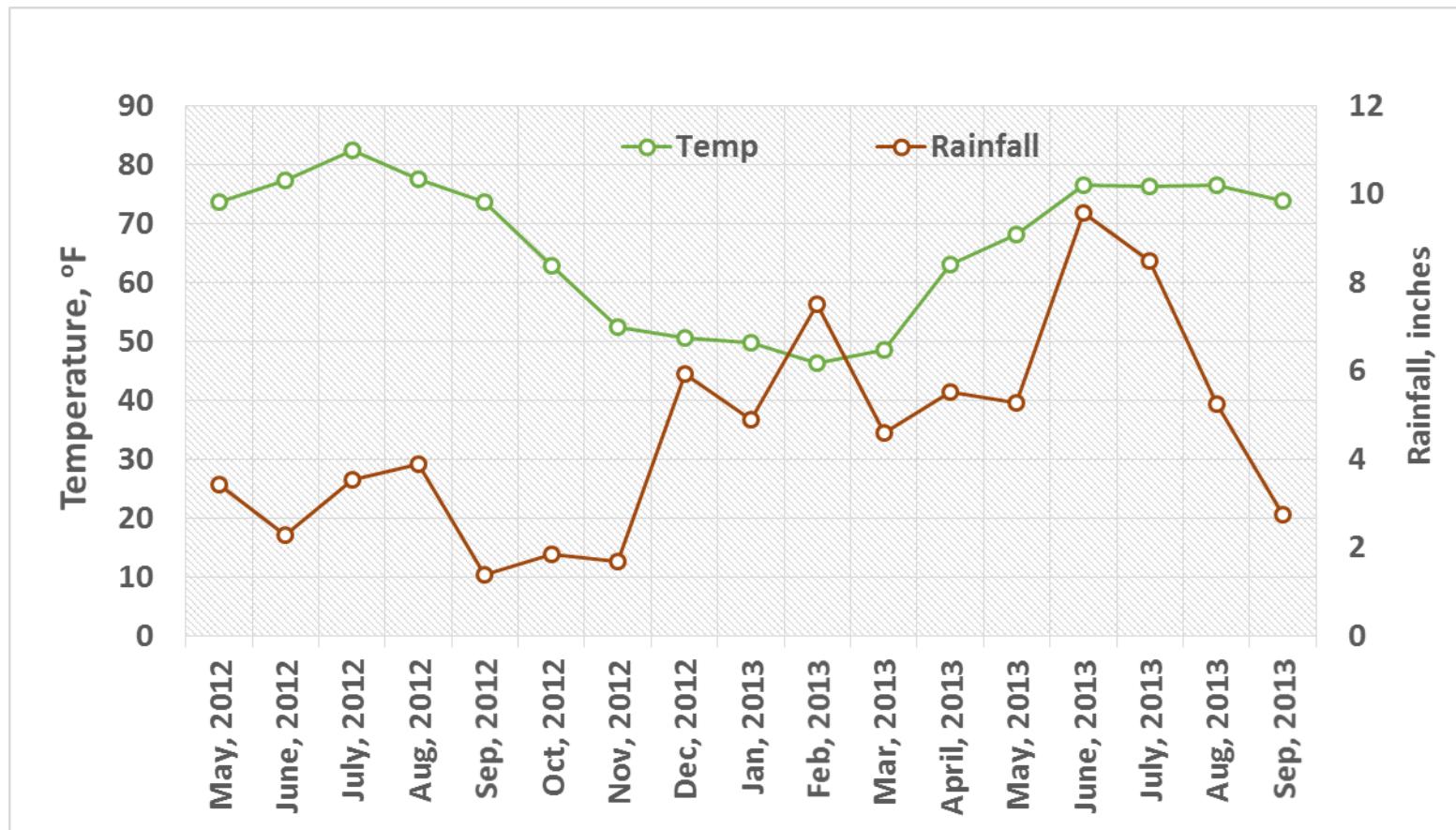
Reactive oxygen species associated with water-soluble PM_{2.5} in the south-eastern United States: spatiotemporal trends and source apportionment

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Supplemental Information

Figure S1: Monthly rainfall and temperature in Atlanta during 2012-2013



Source for Rainfall data: National Oceanic and Atmospheric Administration (http://www.srh.noaa.gov/ffc/?n=rainfall_scorecard)

Source for Temperature data: Georgia Department of Natural Resources (<http://www.air.dnr.state.ga.us/amp/>)

Figure S2: Time-series of the daily average DTT activity (DTTv; Figure S2a and DTTm; Figure S2b) of ambient PM_{2.5} at the sampling site

Figure S2a

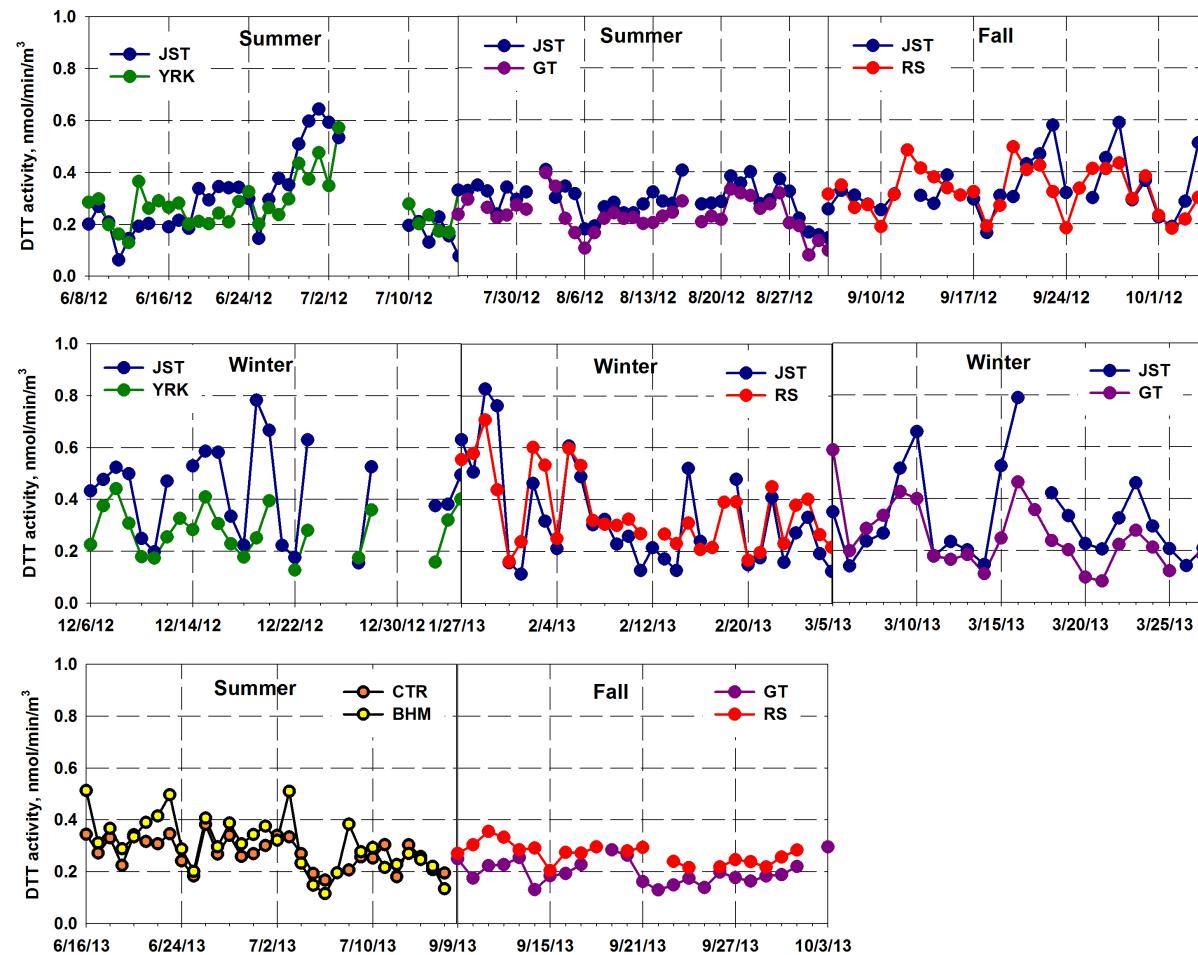


Figure S2b

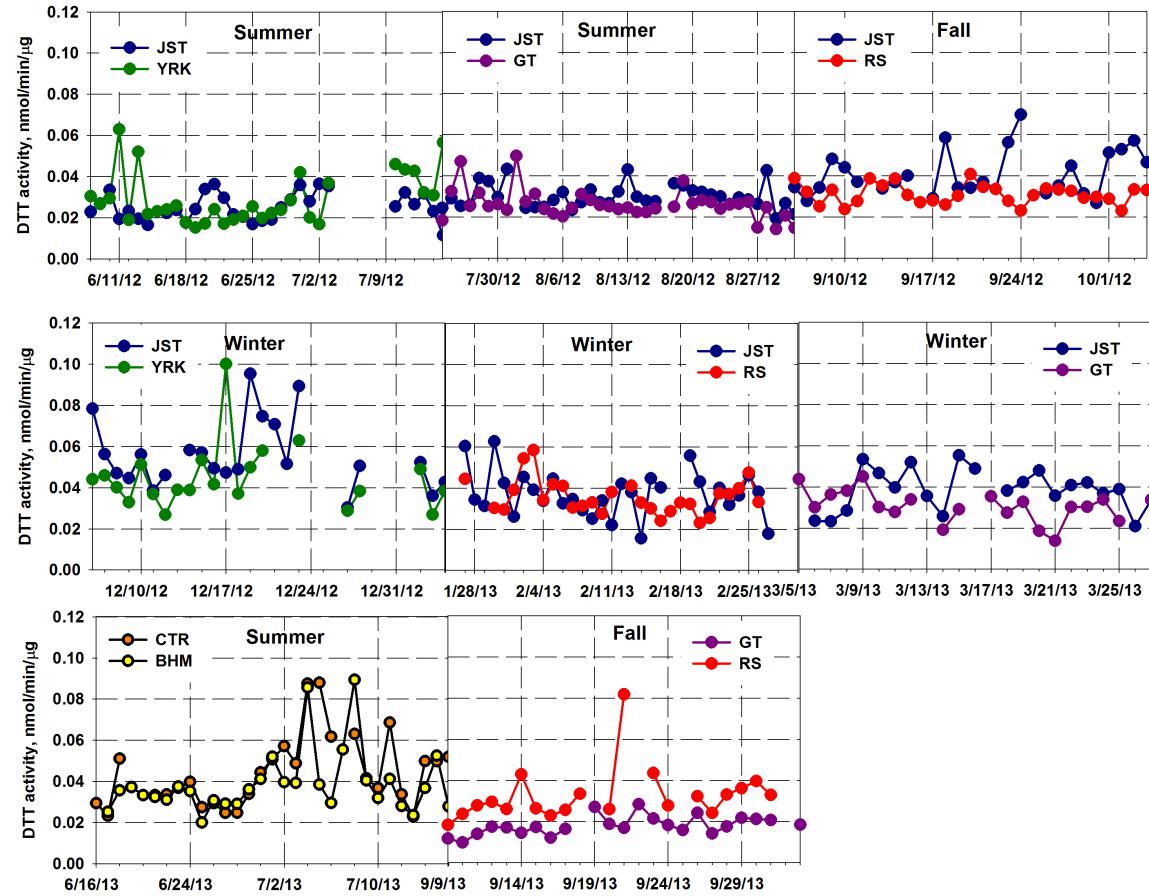


Table S1: Complete regression matrix sorted by each site and season

JST-GT_Summer, 2012												
R	WSOC	BrnC	SO ₄ ⁻²	NH ₄ ⁺	OC	EC	K	Ca	Mn	Fe	Cu	Zn
DTT	0.81	0.67	0.68	0.73	0.81	0.69	0.49	0.20	0.72	0.78	0.71	0.62
WSOC		0.75	0.58	0.66	0.85	0.66	0.52	0.20	0.55	0.62	0.56	0.50
BrnC			0.44	0.51	0.80	0.70	0.59	0.00	0.37	0.56	0.45	0.37
SO₄⁻²				0.96	0.55	0.51	0.30	0.19	0.50	0.71	0.53	0.37
NH₄⁺					0.66	0.53	0.30	0.07	0.55	0.69	0.50	0.32
OC						0.68	0.64	0.11	0.57	0.66	0.41	0.42
EC							0.41	0.39	0.59	0.75	0.58	0.60
K								-0.04	0.33	0.47	0.28	0.37
Ca									0.01	0.12	0.18	0.18
Mn										0.72	0.61	0.65
Fe											0.67	0.65
Cu												0.63
YRK_Summer, 2012												
R	WSOC	BrnC	SO ₄ ⁻²	NH ₄ ⁺	OC	EC	K	Ca	Mn	Fe	Cu	Zn
DTT	0.79	0.53	0.58	0.59	0.76	0.56	0.51	0.68	0.63	0.48	0.09	0.48
WSOC		0.83	0.76	0.82	0.96	0.84	0.70	0.68	0.56	0.69	-0.11	0.49
BrnC			0.72	0.75	0.79	0.82	0.66	0.36	0.32	0.64	-0.12	0.57
SO₄⁻²				0.95	0.73	0.68	0.32	0.46	0.36	0.58	-0.03	0.46
NH₄⁺					0.80	0.76	0.38	0.47	0.35	0.65	0.03	0.48
OC						0.85	0.72	0.81	0.68	0.75	0.02	0.57
EC							0.65	0.49	0.40	0.67	0.12	0.43
K								-0.07	-0.03	-0.09	-0.08	0.09
Ca									0.94	0.45	-0.19	0.48
Mn										0.38	-0.13	0.41

Fe											-0.07	0.49
Cu												0.11

JST_Fall, 2012

R	WSOC	BrnC	SO₄⁻²	NH₄⁺	OC	EC	K	Ca	Mn	Fe	Cu	Zn
DTT	0.72	0.81	0.49	0.52	0.83	0.90	0.61	-0.08	0.37	0.74	0.20	0.82
WSOC		0.92	0.27	0.34	0.78	0.75	0.75	-0.21	-0.16	0.29	-0.08	0.21
BrnC			0.22	0.29	0.78	0.85	0.63	-0.31	0.01	0.47	0.07	0.37
SO₄⁻²				0.95	0.56	0.34	0.57	0.20	0.14	0.67	0.26	0.47
NH₄⁺					0.62	0.34	0.64	0.05	0.16	0.60	0.25	0.47
OC						0.73	0.87	0.03	0.14	0.62	0.25	0.60
EC							0.42	-0.11	0.21	0.90	0.28	0.75
K								0.21	0.31	0.53	0.22	0.44
Ca									-0.13	0.12	-0.24	0.05
Mn										0.54	0.33	0.73
Fe											0.75	0.78
Cu												0.63

RS_Fall, 2012

R	WSOC	BrnC	SO₄⁻²	NH₄⁺	OC	EC	K	Ca	Mn	Fe	Cu	Zn
DTT	0.71	0.59	0.62	0.66	0.77	0.55	0.52	0.12	0.28	0.44	0.61	0.68
WSOC		0.82	0.56	0.56	0.76	0.32	0.31	-0.18	0.14	0.25	0.41	0.33
BrnC			0.23	0.20	0.74	0.38	0.61	0.05	0.46	0.30	0.50	0.37
SO₄⁻²				0.94	0.48	0.21	0.14	-0.04	-0.05	0.44	0.09	0.37
NH₄⁺					0.45	0.35	0.04	-0.24	-0.23	0.40	0.22	0.38
OC						0.34	0.66	0.06	0.49	0.37	0.36	0.48
EC							0.15	-0.01	0.07	0.28	0.61	0.47
K								0.35	0.76	0.35	0.30	0.46
Ca									0.58	0.38	0.06	0.46
Mn										0.18	0.00	0.43

Fe											0.38	0.64
Cu												0.38
JST-GT_Winter, 2012-13												
<i>R</i>	WSOC	BrnC	SO₄⁻²	NH₄⁺	OC	EC	K	Ca	Mn	Fe	Cu	Zn
DTT	0.69	0.78	0.15	0.13	0.85	0.82	0.78	-0.13	0.46	0.65	0.63	0.63
WSOC		0.73	-0.01	0.03	0.83	0.71	0.79	0.00	0.49	0.52	0.55	0.61
BrnC			0.02	0.05	0.81	0.79	0.77	-0.20	0.45	0.62	0.65	0.59
SO₄⁻²				0.88	0.01	0.03	-0.01	-0.06	0.10	0.15	0.09	0.21
NH₄⁺					0.02	0.09	0.02	0.00	0.07	0.24	0.15	0.27
OC						0.90	0.89	0.01	0.54	0.66	0.64	0.68
EC							0.79	-0.06	0.55	0.78	0.74	0.69
K								-0.06	0.46	0.61	0.58	0.65
Ca									0.31	-0.03	-0.29	-0.02
Mn										0.59	0.35	0.52
Fe											0.72	0.67
Cu												0.60
YRK_winter, 2012												
<i>R</i>	WSOC	BrnC	SO₄⁻²	NH₄⁺	OC	EC	K	Ca	Mn	Fe	Cu	Zn
DTT	0.84	0.88	0.34	0.45	0.82	0.80	0.75	0.31	0.68	0.04	0.43	0.72
WSOC		0.79	0.10	0.22	0.93	0.79	0.90	0.40	0.79	-0.02	-0.08	0.73
BrnC			0.18	0.31	0.82	0.85	0.77	0.23	0.68	-0.13	0.20	0.79
SO₄⁻²				0.96	-0.05	0.04	-0.11	-0.18	-0.10	0.01	0.66	-0.08
NH₄⁺					0.09	0.21	0.00	-0.19	-0.01	0.21	0.62	0.01
OC						0.91	0.89	0.27	0.78	0.00	-0.12	0.69
EC							0.71	-0.04	0.65	0.15	-0.02	0.62
K								0.71	0.85	-0.22	-0.20	0.86
Ca									0.78	-0.31	0.24	0.75
Mn										0.12	-0.18	0.89

Fe											-0.13	-0.03
Cu												-0.01

RS_Winter, 2013

<i>R</i>	WSOC	BrnC	SO₄⁻²	NH₄⁺	OC	EC	K	Ca	Mn	Fe	Cu	Zn
DTT	0.78	0.86	0.47	0.52	0.86	0.75	0.69	0.31	0.49	0.57	0.35	0.60
WSOC		0.82	0.66	0.61	0.76	0.68	0.85	0.46	0.70	0.70	0.52	0.71
BrnC			0.42	0.46	0.80	0.63	0.73	0.51	0.65	0.46	0.19	0.67
SO₄⁻²				0.69	0.47	0.42	0.23	-0.20	0.12	0.37	0.30	0.09
NH₄⁺					0.43	0.37	0.33	0.00	0.11	0.49	0.22	0.20
OC						0.87	0.84	0.58	0.76	0.69	0.58	0.48
EC							0.73	0.36	0.54	0.63	0.70	0.53
K								0.59	0.76	0.73	0.59	0.53
Ca									0.80	0.21	0.12	0.15
Mn										0.56	0.37	0.54
Fe											0.60	0.48
Cu												0.42

CTR_Summer, 2013

<i>R</i>	WSOC	BrnC	SO₄⁻²	NH₄⁺	OC	EC	K	Ca	Mn	Fe	Cu	Zn
DTT	0.78	0.88	0.71	0.78	0.77	0.72	0.66	0.23	0.36	0.41	-0.12	0.62
WSOC		0.82	0.67	0.75	0.94	0.89	0.86	0.12	0.25	0.33	0.00	0.51
BrnC			0.62	0.65	0.81	0.74	0.77	0.23	0.31	0.52	-0.07	0.61
SO₄⁻²				0.95	0.65	0.63	0.55	0.33	0.45	0.56	-0.17	0.31
NH₄⁺					0.76	0.71	0.58	0.18	0.28	0.45	-0.04	0.48
OC						0.95	0.86	0.16	0.21	0.33	0.10	0.58
EC							0.83	0.15	0.26	0.29	0.10	0.65
K								0.25	0.32	0.32	0.12	0.26
Ca									0.72	0.05	-0.23	-0.14
Mn										0.39	-0.33	-0.05

Fe											-0.10	0.29
Cu												0.39

BHM_Summer, 2013

R	WSOC	BrnC	SO₄⁻²	NH₄⁺	OC	EC	K	Ca	Mn	Fe	Cu	Zn
DTT	0.67	0.74	0.66	0.66	0.85	0.68	0.41	0.55	0.75	0.66	0.23	0.66
WSOC		0.67	0.54	0.44	0.81	0.63	0.19	0.58	0.37	0.71	0.12	0.25
BrnC			0.63	0.56	0.85	0.74	0.24	0.76	0.39	0.51	0.07	0.38
SO₄⁻²				0.95	0.68	0.56	0.13	0.32	0.29	0.65	-0.04	0.27
NH₄⁺					0.68	0.51	0.14	0.17	0.25	0.70	-0.12	0.30
OC						0.81	0.36	0.67	0.54	0.67	0.04	0.49
EC							0.18	0.67	0.27	0.61	0.05	0.22
K								0.11	0.29	0.25	0.24	0.14
Ca									0.49	0.35	0.36	0.33
Mn										0.20	0.33	0.83
Fe											-0.06	0.31
Cu												0.13

GT_Fall, 2013

R	WSOC	BrnC	SO₄⁻²	NH₄⁺	OC	EC	K	Ca	Mn	Fe	Cu	Zn
DTT	0.47	0.75	0.39	0.37	0.79	0.78	0.65	0.29	0.58	0.66	0.46	0.46
WSOC		0.62	0.81	0.78	0.43	0.40	0.32	0.05	0.14	0.52	0.14	0.04
BrnC			0.38	0.32	0.81	0.77	0.72	0.29	0.65	0.72	0.43	0.51
SO₄⁻²				0.98	0.41	0.35	0.31	-0.06	0.15	0.60	0.14	0.01
NH₄⁺					0.39	0.32	0.27	-0.12	0.09	0.56	0.06	0.05
OC						0.90	0.90	0.42	0.77	0.94	0.67	0.67
EC							0.78	0.39	0.65	0.88	0.71	0.68
K								0.45	0.81	0.79	0.61	0.61
Ca									0.68	0.41	0.38	0.17
Mn										0.83	0.57	0.65

Fe											0.67	0.64
Cu												0.48
RS_Fall, 2013												
<i>R</i>	WSOC	BrnC	SO₄⁻²	NH₄⁺	OC	EC	K	Ca	Mn	Fe	Cu	Zn
DTT	0.21	0.48	0.60	0.47	0.58	0.53	0.74	0.79	0.84	0.53	-0.09	0.74
WSOC		-0.02	0.26	0.23	0.28	0.12	0.23	0.42	0.37	-0.03	-0.24	0.33
BrnC			0.19	0.15	0.62	0.45	0.51	0.39	0.48	0.57	0.13	0.55
SO₄⁻²				0.96	0.40	0.35	0.40	0.65	0.70	0.55	-0.02	0.65
NH₄⁺					0.35	0.39	0.31	0.54	0.61	0.52	-0.04	0.62
OC						0.67	0.85	0.54	0.78	0.81	0.06	0.80
EC							0.40	0.24	0.42	0.64	-0.03	0.55
K								0.66	0.84	0.63	0.10	0.88
Ca									0.91	0.46	-0.05	0.69
Mn										0.66	0.22	0.90
Fe											-0.01	0.62
Cu												0.22