Supplementary Materials

WRF-Chem Modeling of Summertime Air Pollution in the Northern Great Plains: Chemistry and Aerosol Mechanism Intercomparison

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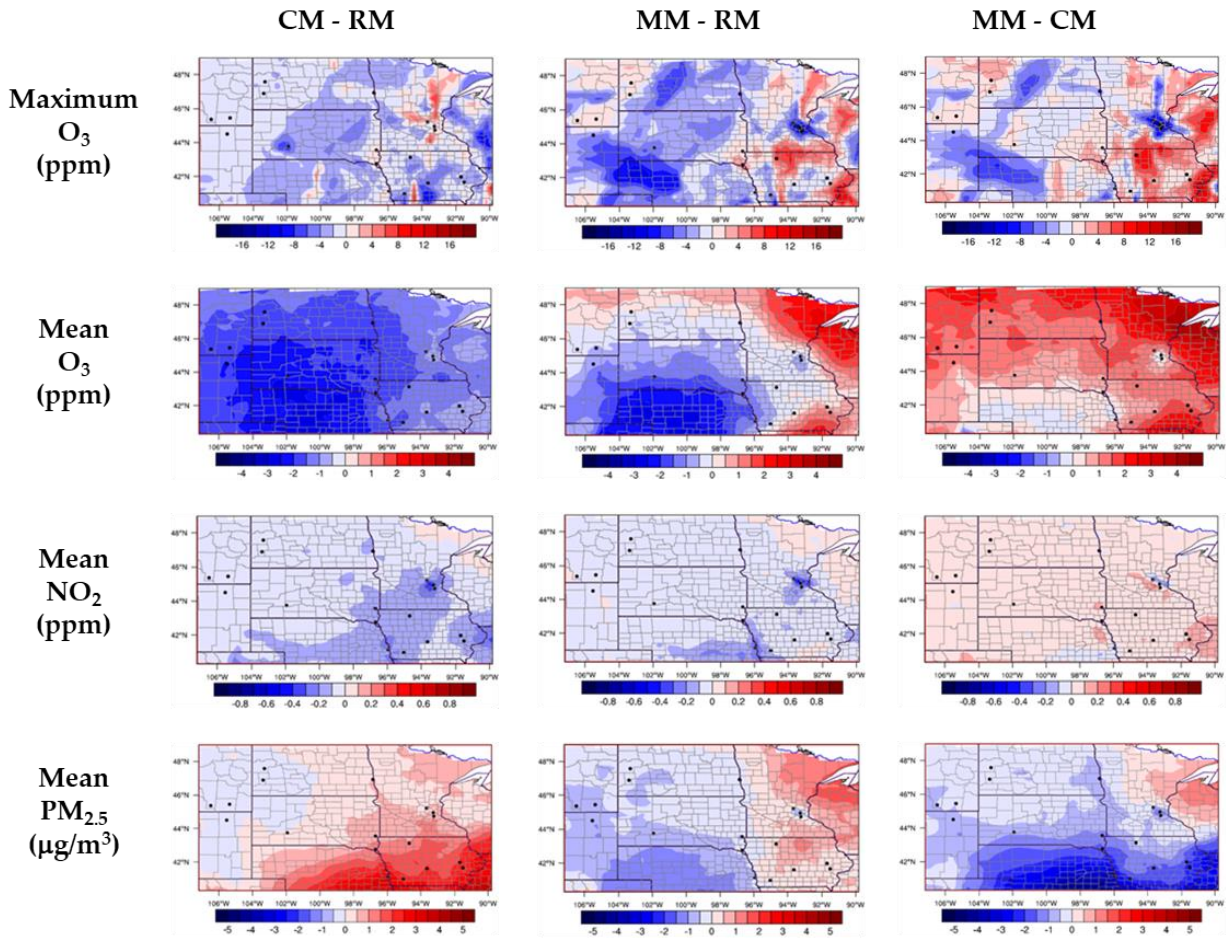


Figure S1. Differences between model predictions of maximum hourly O_3, mean O_3, NO_2, and $PM_{2.5}$ for July 2010. Model predictions from RACM-MADE/SORGAM (RM), CBMZ-MOSAIC (CM), and MOZART-MOSAIC (MM) chemistry-aerosol mechanisms.

Table S1. Meteorology and air quality monitoring sites and available measurements.

AQS Site ID	State	Location	Latitude	Longitude	T2	WS	PSFC	RH	O_3	NO_2	$PM_{2.5}$	OC	EC	SO_4^{-2}	NO_3^-	NH_4^+
					Hourly Data[1]							Daily Averaged Data[2]				
Eastern Sites																
19-045-0021	IA	Clinton	41.8750	−90.1776	x		x	x	x							
19-103-2001	IA	Iowa City	41.6572	−91.5035							x					
19-113-0040	IA	Cedar Rapids	41.9768	−91.6877	x	x	x	x	x		x			x		
19-137-0002	IA	Viking Lake	40.9691	−95.0450	x		x	x	x		x	x	x	x	x	
19-147-1002	IA	Emmetsburg	43.1237	−94.6935	x		x	x	x		x					
19-153-0030	IA	Des Moines	41.6032	−93.6431	x	x		x	x	x	x			x	x	x
19-163-0015	IA	Davenport	41.5300	−90.5876	x		x	x	x					x	x	x
19-177-0006	IA	Lake Sugema	40.6951	−92.0063	x		x	x	x			x	x	x	x	
27-003-1002	MN	Blaine	45.1377	−93.2076					x	x						
27-037-0470	MN	Apple Valley	44.7385	−93.2373							x					
27-053-0963	MN	Minneapolis	44.9537	−93.2582							x					
27-075-0005	MN	Bound. Waters	47.9486	−91.4956					x			x	x	x	x	
27-109-5008	MN	Rochester	43.9969	−92.4504					x					x	x	x
27-133-9000	MN	Blue Mounds	43.7158	−96.1916								x	x	x	x	
27-137-0034	MN	Voyageurs NP	48.4125	−92.8292	x				x			x	x	x	x	
27-137-7550	MN	Duluth	46.8183	−92.0894					x							
27-139-0505	MN	Shakopee	44.7914	−93.5125					x							
27-169-9000	MN	Grt. River Bluffs	43.9373	−91.4053								x	x	x	x	
27-171-3201	MN	St. Michael	45.2092	−93.6692					x		x					
31-055-0019	NE	Omaha	41.2475	−95.9731										x	x	x
31-055-0028	NE	Omaha	41.2080	−95.9459					x							
31-109-0016	NE	Lincoln	40.9847	−96.6775					x							
31-153-0007	NE	Bellevue	41.1333	−95.9561							x					
38-017-1004	ND	Fargo	46.9338	−96.8554	x	x	x	x	x	x	x			x	x	x
46-099-0008	SD	Sioux Falls	43.5479	−96.7008	x	x			x	x	x			x	x	x
46-127-0001	SD	Sioux City	42.7515	−96.7072						x	x					
55-003-0010	WI	Ashland	46.6023	−90.6561					x							
55-063-0012	WI	La Crosse	43.7775	−91.2269					x							
Western Sites																
30-075-0001	MT	Broadus	45.4495	−105.3703	x				x	x	x					
30-085-9000	MT	Ft Peck	48.3080	−104.1029								x	x	x	x	
30-087-0001	MT	Birney	45.3662	−106.4898					x		x					
30-087-0762	MT	N. Cheyenne	45.6483	−106.5572								x	x	x	x	
30-091-9000	MT	Medicine Lake	48.4871	−104.4760								x	x	x	x	
31-069-9000	NE	Crescent Lake	41.7627	−102.4341								x	x	x	x	
31-171-9000	NE	Halsey	41.8888	−100.3391								x	x	x	x	

C56-SAN189	NE	Sante Sioux Res.	42.7131	−97.8286				x							
38-007-0002	ND	Dickinson	46.8943	−103.3785	x	x		x	x		x	x	x	x	x
38-013-0004	ND	Lostwood NWR	48.6419	−102.4018								x	x	x	x
38-053-0002	ND	TRNP-NU	47.5812	−103.2995			x		x	x	x				
38-057-0004	ND	Beulah North	47.2986	−101.7669			x		x	x					
46-033-0132	SD	Rapid City	43.5576	−103.4839	x	x		x	x			x	x	x	x
46-071-0001	SD	Badlands	43.7456	−101.9412					x	x	x	x	x	x	x
56-005-0892	WY	PRB-Belle Ayr	44.0971	−105.3432	x					x					
56-005-1899	WY	PRB-Buckskin	44.5027	−105.5398	x						x				
C31-CNT169	WY	Centennial	41.2983	−106.1417				x							

[1]Hourly observations of temperature at 2m (T2), wind speed at 10m (WS), surface pressure (PSFC), relative humidity (RH) and gas phase concentrations.

[2]Observed daily average data for $PM_{2.5}$ subscpecies reported every third day

Table S2. Statistical analysis of predicted hourly near ground temperature at individual monitoring sites during July 2010 for the RACM-MADE/SORGAM (RM), CBMZ-MOSAIC (CM), and MOZART-MOSAIC (MM) chemistry-aerosol mechanisms.

			RACM-MADE/SORGAM					CBMZ-MOSAIC					MOZART-MOSAIC				
	AQS Site ID	M_{obs}	M	*R*	MB	NMB (%)	RMSE	M	*R*	MB	NMB (%)	RMSE	M	*R*	MB	NMB (%)	RMSE
T2 (°C)	19-045-0021	25.0	24.5	0.81	−0.4	-1.7	2.5	24.6	0.81	-0.4	-1.6	2.5	24.6	0.82	-0.3	-1.3	2.5
	19-113-0040	24.9	24.0	0.78	−0.9	-3.7	2.9	24.0	0.77	-0.9	-3.5	2.9	24.1	0.79	-0.8	-3.4	2.8
	19-137-0002	24.6	25.7	0.80	1.1	4.4	2.8	25.8	0.80	1.2	5.0	2.9	25.8	0.80	1.2	5.0	3.0
	19-147-1002	23.7	23.3	0.72	−0.4	-1.7	3.2	23.4	0.73	-0.3	-1.4	3.2	23.4	0.73	-0.3	-1.3	3.2
	19-153-0030	25.5	24.1	0.81	−1.4	-5.6	2.8	24.1	0.79	-1.4	-5.5	2.8	24.2	0.81	-1.3	-5.1	2.7
	19-163-0015	25.2	24.4	0.79	−0.7	-3.0	2.5	24.5	0.79	-0.7	-2.7	2.5	24.5	0.81	-0.7	-2.8	2.5
	19-177-0006	25.3	24.6	0.82	−0.7	-2.7	2.4	24.7	0.81	-0.6	-2.4	2.4	24.7	0.82	-0.6	-2.4	2.4
	27-137-0034	20.2	21.4	0.66	1.2	5.9	3.9	21.4	0.64	1.2	6.0	3.9	21.3	0.65	1.1	5.6	3.9
	38-017-1004	22.2	24.6	0.89	2.3	10.5	3.6	24.5	0.89	2.2	10.0	3.5	24.7	0.89	2.4	10.9	3.6
	46-099-0008	23.4	24.2	0.79	0.8	3.2	3.1	24.3	0.80	0.8	3.6	3.1	24.4	0.79	0.9	4.0	3.2
	East Average	**24.0**	**24.1**	**0.79**	**0.1**	**0.6**	**3.0**	**24.1**	**0.78**	**0.1**	**0.8**	**3.0**	**24.2**	**0.79**	**0.2**	**0.9**	**3.0**
	30-075-0001	21.2	22.3	0.89	1.1	5.4	3.1	22.4	0.89	1.2	5.6	3.1	22.5	0.88	1.3	6.4	3.2
	38-007-0002	20.2	21.5	0.89	1.3	6.3	2.8	21.5	0.88	1.3	6.4	2.8	21.7	0.89	1.5	7.3	2.9
	46-033-0132	21.2	22.8	0.68	1.7	7.8	4.2	22.9	0.69	1.7	8.1	4.2	23.0	0.67	1.9	8.8	4.3
	56-005-0892	20.1	21.0	0.86	0.9	4.7	3.8	21.0	0.85	0.9	4.5	3.9	21.1	0.87	1.0	5.2	3.8
	56-005-1899	21.0	21.6	0.86	0.6	2.9	3.3	21.5	0.85	0.5	2.5	3.3	21.7	0.86	0.7	3.3	3.3
	West Average	**20.7**	**21.9**	**0.84**	**1.1**	**5.4**	**3.4**	**21.9**	**0.83**	**1.1**	**5.4**	**3.5**	**22.0**	**0.83**	**1.3**	**6.2**	**3.5**
	Total Average	**22.9**	**23.3**	**0.80**	**0.4**	**2.2**	**3.1**	**23.4**	**0.80**	**0.5**	**2.3**	**3.1**	**23.5**	**0.80**	**0.5**	**2.7**	**3.2**

Table S3. Statistical analysis of predicted hourly surface pressure at individual monitoring sites during July 2010 for the RACM-MADE/SORGAM (RM), CBMZ-MOSAIC (CM), and MOZART-MOSAIC (MM) chemistry-aerosol mechanisms.

			RACM-MADE/SORGAM					CBMZ-MOSAIC					MOZART-MOSAIC				
	AQS Site ID	**M_{obs}**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**
PSFC (hPa)	19-045-0021	993.0	989.1	0.92	-3.9	-0.4	4.2	989.0	0.92	-3.9	-0.4	4.3	988.8	0.92	-4.2	-0.4	4.5
	19-113-0040	985.8	981.7	0.89	-4.1	-0.4	4.6	981.6	0.89	-4.2	-0.4	4.6	981.4	0.89	-4.4	-0.4	4.9
	19-137-0002	969.9	970.0	0.90	0.2	0.0	1.7	970.0	0.90	0.1	0.0	1.8	969.7	0.89	-0.1	0.0	1.9
	19-147-1002	968.8	965.5	0.89	-3.3	-0.3	3.9	965.4	0.89	-3.4	-0.4	3.9	965.3	0.88	-3.6	-0.4	4.2
	19-163-0015	988.7	986.6	0.93	-2.1	-0.2	2.6	986.6	0.92	-2.1	-0.2	2.7	986.3	0.92	-2.4	-0.2	2.9
	19-177-0006	987.2	986.6	0.92	-0.6	-0.1	1.6	986.6	0.92	-0.6	-0.1	1.7	986.3	0.91	-0.9	-0.1	1.9
	38-017-1004	976.4	978.4	0.95	2.0	0.2	2.5	978.3	0.95	1.9	0.2	2.5	978.2	0.94	1.8	0.2	2.5
	East Average	**981.4**	**979.7**	**0.92**	**-1.7**	**-0.2**	**3.0**	**979.6**	**0.91**	**-1.8**	**-0.2**	**3.1**	**979.4**	**0.90**	**-2.0**	**-0.2**	**3.2**
	38-053-0002	944.2	930.2	0.95	-14.0	-1.5	14.1	930.2	0.95	-14.0	-1.5	14.1	930.1	0.95	-14.1	-1.5	14.2
	38-057-0004	938.0	941.5	0.94	3.5	0.4	3.9	941.5	0.94	3.5	0.4	3.9	941.4	0.93	3.4	0.4	3.8
	West Average	**941.1**	**935.9**	**0.94**	**-5.3**	**-0.6**	**9.0**	**935.9**	**0.94**	**-5.3**	**-0.6**	**9.0**	**935.8**	**0.94**	**-5.4**	**-0.6**	**9.0**
	Total Average	**972.4**	**970.0**	**0.92**	**-2.5**	**-0.3**	**4.3**	**969.9**	**0.92**	**-2.5**	**-0.3**	**4.4**	**969.7**	**0.91**	**-2.7**	**-0.3**	**4.5**

Table S4. Statistical analysis of predicted hourly relative humidity at individual monitoring sites during July 2010 for the RACM-MADE/SORGAM (RM), CBMZ-MOSAIC (CM), and MOZART-MOSAIC (MM) chemistry-aerosol mechanisms.

			RACM-MADE/SORGAM					CBMZ-MOSAIC					MOZART-MOSAIC				
	AQS Site ID	**M_{obs}**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**
RH2 (%)	38-017-1004	74.4	55.4	0.71	-19.0	-25.5	26.0	56.3	0.72	-18.2	-24.4	25.5	54.4	0.76	-20.1	-27.0	25.5
	19-045-0021	89.8	83.0	0.66	-6.8	-7.6	15.1	82.4	0.66	-7.4	-8.2	15.6	82.1	0.66	-7.6	-8.5	15.7
	19-113-0040	71.0	84.2	0.73	13.2	18.6	17.5	83.8	0.72	12.8	18.0	17.2	83.7	0.72	12.7	17.9	17.2
	19-137-0002	96.9	76.8	0.43	-20.1	-20.7	28.1	75.9	0.43	-21.0	-21.6	29.2	76.3	0.43	-20.6	-21.2	29.3
	19-147-1002	90.2	82.1	0.68	-8.1	-9.0	15.3	81.4	0.68	-8.8	-9.7	15.9	80.4	0.69	-9.7	-10.8	16.8
	19-153-0030	83.2	85.8	0.72	2.7	3.2	12.2	85.7	0.69	2.5	3.0	12.7	85.1	0.71	1.9	2.3	12.4
	19-163-0015	83.0	84.5	0.64	1.5	1.8	15.2	84.3	0.65	1.3	1.5	15.0	84.4	0.67	1.4	1.6	14.7
	19-177-0006	87.2	87.8	0.72	0.6	0.7	12.3	87.6	0.73	0.4	0.5	12.2	87.2	0.72	0.0	0.0	12.4
	East Average	**84.5**	**79.9**	**0.66**	**-4.5**	**-4.8**	**17.7**	**79.7**	**0.66**	**-4.8**	**-5.1**	**17.9**	**79.2**	**0.67**	**-5.2**	**-5.7**	**18.0**
	38-007-0002	60.9	61.3	0.74	0.4	0.7	15.1	60.9	0.73	0.1	0.1	15.3	60.3	0.75	-0.5	-0.9	14.6
	46-033-0132	54.9	56.3	0.57	1.4	2.6	18.2	55.8	0.58	0.9	1.6	17.8	55.4	0.57	0.5	1.0	18.1
	C56-CNT169	51.2	54.6	0.65	3.4	6.6	21.0	54.4	0.65	3.2	6.2	21.0	54.0	0.63	2.8	5.4	21.2
	C31-SAN189	69.8	58.7	0.71	-11.1	-15.9	20.0	59.0	0.70	-10.8	-15.5	20.2	58.6	0.68	-11.2	-16.0	20.8
	West Average	**59.2**	**57.7**	**0.67**	**-1.5**	**-1.5**	**18.6**	**57.5**	**0.66**	**-1.7**	**-1.9**	**18.6**	**57.1**	**0.66**	**-2.1**	**-2.6**	**18.7**
	Total Average	**76.0**	**72.5**	**0.66**	**-3.5**	**-3.7**	**18.0**	**72.3**	**0.66**	**-3.8**	**-4.0**	**18.1**	**71.8**	**0.67**	**-4.2**	**-4.7**	**18.2**

Table S5. Statistical analysis of predicted hourly 10m wind speed at individual monitoring sites during July 2010 for the RACM-MADE/SORGAM (RM), CBMZ-MOSAIC (CM), and MOZART-MOSAIC (MM) chemistry-aerosol mechanisms.

			RACM-MADE/SORGAM					CBMZ-MOSAIC					MOZART-MOSAIC				
	AQS Site ID	**M_{obs}**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**
WS 10m (m/s)	19-113-0040	1.1	2.6	0.52	1.5	141.8	1.7	2.6	0.51	1.6	147.5	1.8	2.6	0.54	1.5	143.2	1.7
	19-153-0030	1.5	2.3	0.60	0.8	54.3	1.2	2.3	0.55	0.8	53.7	1.2	2.3	0.56	0.8	55.2	1.2
	38-017-1004	3.9	4.0	0.76	0.1	1.6	1.6	4.0	0.74	0.1	2.7	1.7	4.1	0.71	0.1	3.0	1.8
	46-099-0008	2.1	2.7	0.58	0.6	30.0	1.3	2.8	0.58	0.7	33.9	1.3	2.7	0.51	0.6	31.0	1.4
	East Average	**2.1**	**2.9**	**0.61**	**0.8**	**56.9**	**1.5**	**2.9**	**0.59**	**0.8**	**59.4**	**1.5**	**2.9**	**0.58**	**0.8**	**58.1**	**1.5**
	38-007-0002	4.2	2.3	0.42	-1.9	-45.4	2.6	2.3	0.41	-1.9	-45.7	2.6	2.3	0.43	-1.8	-44.1	2.5
	46-033-0132	2.7	2.8	0.15	0.1	2.4	1.9	2.8	0.16	0.1	2.4	1.9	2.8	0.15	0.1	2.7	2.0
	West Average	**3.4**	**2.5**	**0.29**	**-0.9**	**-21.5**	**2.2**	**2.5**	**0.29**	**-0.9**	**-21.7**	**2.2**	**2.6**	**0.29**	**-0.9**	**-20.7**	**2.2**
	Total Average	**2.6**	**2.8**	**0.50**	**0.2**	**30.8**	**1.7**	**2.8**	**0.49**	**0.2**	**32.4**	**1.8**	**2.8**	**0.48**	**0.2**	**31.8**	**1.8**

Table S6. Statistical analysis of predicted hourly O_3 concentrations at individual monitoring sites during July 2010 for the RACM-MADE/SORGAM (RM), CBMZ-MOSAIC (CM), and MOZART-MOSAIC (MM) chemistry-aerosol mechanisms.

			RACM-MADE/SORGAM					CBMZ-MOSAIC					MOZART-MOSAIC				
	AQS Site ID	M_{obs}	M	*R*	MB	NMB (%)	RMSE	M	*R*	MB	NMB (%)	RMSE	M	*R*	MB	NMB (%)	RMSE
O_3 (ppb)	19-045-0021	31.6	37.3	0.47	5.6	17.8	13.9	36.6	0.51	5.0	15.7	13.0	38.3	0.50	6.6	20.9	13.8
	19-113-0040	30.0	37.7	0.56	7.7	25.8	13.9	37.1	0.59	7.1	23.6	13.1	38.1	0.59	8.1	26.9	13.8
	19-137-0002	29.9	39.2	0.47	9.3	31.1	14.9	37.6	0.51	7.8	26.0	13.6	38.7	0.51	8.9	29.7	14.2
	19-147-1002	31.7	36.3	0.44	4.7	14.8	11.7	34.9	0.46	3.2	10.2	11.0	36.2	0.48	4.5	14.3	11.3
	19-153-0030	25.5	36.4	0.50	11.0	43.1	15.9	35.6	0.52	10.1	39.7	15.1	36.1	0.52	10.6	41.6	15.3
	19-163-0015	32.2	37.0	0.54	4.9	15.1	12.4	36.5	0.58	4.3	13.4	11.5	37.8	0.57	5.6	17.4	12.2
	19-177-0006	33.1	37.3	0.47	4.2	12.6	12.1	36.5	0.50	3.4	10.3	11.5	39.3	0.53	6.2	18.7	12.4
	27-003-1002	31.0	32.4	0.70	1.4	4.4	11.8	31.6	0.71	0.6	1.9	11.7	31.7	0.70	0.7	2.2	11.3
	27-075-0005	28.5	32.3	0.61	3.8	13.4	8.0	31.3	0.62	2.8	9.8	7.3	34.8	0.62	6.2	21.9	9.3
	27-109-5008	28.4	36.3	0.54	8.0	28.1	14.9	35.1	0.55	6.7	23.7	14.1	36.4	0.55	8.1	28.4	14.9
	27-137-0034	32.6	34.4	0.45	1.8	5.6	9.4	33.4	0.52	0.8	2.5	8.6	36.8	0.45	4.2	13.0	10.1
	27-137-7550	25.2	31.8	0.55	6.6	26.3	10.7	30.9	0.56	5.7	22.7	9.9	34.7	0.55	9.5	37.7	12.8
	27-139-0505	29.5	32.4	0.65	2.8	9.6	11.5	31.9	0.67	2.4	8.0	11.3	31.6	0.68	2.1	7.0	10.4
	27-171-3201	29.9	35.1	0.57	5.2	17.3	12.0	33.8	0.61	3.9	13.0	11.1	35.2	0.61	5.3	17.8	11.5
	31-055-0028	27.0	35.6	0.53	8.7	32.1	15.1	34.7	0.57	7.7	28.5	14.3	34.2	0.58	7.2	26.6	13.5
	31-109-0016	21.5	39.0	0.39	17.6	81.8	21.1	37.4	0.45	15.9	74.1	19.4	37.7	0.51	16.2	75.7	19.1
	38-017-1004	26.4	34.3	0.59	7.9	30.0	12.5	32.7	0.59	6.3	24.0	11.4	36.2	0.51	9.8	37.3	15.4
	46-099-0008	30.5	35.6	0.50	5.1	16.8	11.8	34.0	0.52	3.5	11.6	10.9	34.4	0.51	3.9	12.9	11.0
	55-003-0010	27.0	32.5	0.58	5.4	20.1	13.3	31.6	0.61	4.5	16.8	12.8	35.3	0.61	8.3	30.6	14.5
	55-063-0012	31.0	36.7	0.59	5.7	18.3	12.3	35.4	0.62	4.4	14.3	11.5	37.7	0.61	6.7	21.7	12.8
	East Average	**29.1**	**35.5**	**0.53**	**6.4**	**23.2**	**13.0**	**34.4**	**0.56**	**5.3**	**19.5**	**12.2**	**36.1**	**0.56**	**6.9**	**25.1**	**13.0**
	30-075-0001	34.4	39.5	0.45	5.1	14.8	11.5	37.6	0.43	3.2	9.2	11.0	38.9	0.47	4.5	13.1	11.3
	30-087-0001	31.2	39.5	0.40	8.3	26.7	14.2	37.8	0.38	6.6	21.0	13.3	39.3	0.44	8.1	25.9	13.8
	38-007-0002	35.6	37.2	0.53	1.6	4.4	8.2	35.5	0.48	-0.1	-0.2	8.4	37.0	0.46	1.4	3.9	8.9
	38-053-0002	31.0	36.2	0.49	5.2	16.6	12.1	34.7	0.44	3.6	11.7	11.8	36.2	0.44	5.2	16.7	12.3
	38-057-0004	30.5	35.2	0.55	4.6	15.1	9.7	33.6	0.51	3.0	9.9	9.3	35.1	0.47	4.6	14.9	10.1
	46-033-0132	40.5	41.0	0.46	0.5	1.2	7.9	38.6	0.44	-1.9	-4.6	8.2	39.4	0.40	-1.0	-2.6	8.1
	46-071-0001	37.2	38.7	0.46	1.5	4.1	9.4	36.3	0.45	-0.8	-2.3	9.2	37.2	0.46	0.0	0.1	9.1
	West Average	**34.3**	**38.2**	**0.48**	**3.8**	**11.8**	**10.4**	**36.3**	**0.45**	**1.9**	**6.4**	**10.2**	**37.6**	**0.45**	**3.2**	**10.3**	**10.5**
	Total Average	**30.5**	**36.2**	**0.52**	**5.7**	**20.3**	**12.3**	**34.9**	**0.53**	**4.4**	**16.1**	**11.6**	**36.5**	**0.53**	**6.0**	**21.3**	**12.3**

Table S7. Statistical analysis of predicted hourly NO_2 concentrations at individual monitoring sites during July 2010 for the RACM-MADE/SORGAM (RM), CBMZ-MOSAIC (CM), and MOZART-MOSAIC (MM) chemistry-aerosol mechanisms.

			RACM-MADE/SORGAM					**CBMZ-MOSAIC**					**MOZART-MOSAIC**				
	AQS Site ID	**M_{obs}**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**
NO_2 (ppb)	19-153-0030	7.2	4.9	0.47	-2.3	-31.5	5.2	4.8	0.45	-2.4	-33.0	5.3	4.9	0.46	-2.3	-32.4	5.2
	27-003-1002	5.3	10.9	0.38	5.6	106.4	9.1	10.6	0.39	5.3	101.3	8.8	10.4	0.40	5.1	97.4	8.6
	38-017-1004	2.2	1.8	0.39	-0.4	-18.1	2.7	1.7	0.38	-0.5	-23.1	2.8	1.7	0.35	-0.5	-22.1	2.8
	46-099-0008	3.3	3.5	0.40	0.2	7.2	3.2	3.3	0.41	0.0	-0.2	3.2	3.4	0.37	0.2	4.9	3.3
	46-127-0001	1.5	2.0	0.44	0.4	28.7	1.3	1.8	0.46	0.3	17.1	1.2	1.9	0.47	0.3	21.9	1.2
	East Average	**3.9**	**4.6**	**0.42**	**0.7**	**18.5**	**4.3**	**4.4**	**0.42**	**0.5**	**12.4**	**4.2**	**4.5**	**0.41**	**0.6**	**13.9**	**4.2**
	30-075-0001	2.2	0.4	0.09	-1.8	-82.8	2.1	0.3	0.10	-1.9	-84.3	2.2	0.4	0.10	-1.8	-83.6	2.2
	38-053-0002	0.6	0.7	0.56	0.1	15.9	0.5	0.6	0.57	0.0	5.0	0.5	0.6	0.53	0.1	8.9	0.5
	38-057-0004	2.3	0.8	0.03	-1.4	-63.1	2.9	0.8	0.02	-1.5	-66.7	3.0	0.8	0.02	-1.5	-64.7	3.0
	46-071-0001	0.4	0.5	0.46	0.1	38.7	0.5	0.5	0.41	0.1	25.3	0.5	0.5	0.43	0.1	32.3	0.5
	56-005-0892	5.8	4.8	0.66	-1.0	-17.1	4.6	4.7	0.66	-1.1	-18.4	4.7	4.8	0.66	-1.0	-0.2	4.6
	West Average	**2.2**	**1.4**	**0.36**	**-0.8**	**-21.7**	**2.2**	**1.4**	**0.35**	**-0.9**	**-27.8**	**2.2**	**1.4**	**0.35**	**-0.8**	**-21.4**	**2.2**
	Total Average	**3.1**	**3.0**	**0.39**	**0.0**	**-1.6**	**3.2**	**2.9**	**0.38**	**-0.2**	**-7.7**	**3.2**	**2.9**	**0.38**	**-0.1**	**-3.8**	**3.2**

Table S8. Statistical analysis of predicted hourly $PM_{2.5}$ concentrations at individual monitoring sites during July 2010 for the RACM-MADE/SORGAM (RM), CBMZ-MOSAIC (CM), and MOZART-MOSAIC (MM) chemistry-aerosol mechanisms.

			RACM-MADE/SORGAM					CBMZ-MOSAIC					MOZART-MOSAIC				
	AQS Site ID	**M_{obs}**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**
$PM_{2.5}$ ($\mu g/m^3$)	19-103-2001	12.7	10.6	0.03	-2.1	-1.6	6.6	13.3	0.06	0.5	4.1	8.4	10.8	0.22	-1.9	-15.2	5.5
	19-113-0040	8.4	10.3	0.03	1.9	22.5	7.4	12.5	0.11	4.1	48.0	9.3	10.6	0.19	2.1	25.0	6.5
	19-137-0002	8.7	9.1	0.17	0.4	4.7	6.0	11.2	0.22	2.6	29.5	8.0	9.2	0.01	0.5	6.2	6.0
	19-147-1002	7.3	7.7	-0.13	0.4	5.3	6.2	8.6	0.00	1.3	17.6	6.9	8.3	-0.14	0.9	12.4	6.5
	19-153-0030	7.5	11.0	0.08	3.5	46.8	7.4	13.1	0.11	5.6	74.8	9.8	11.2	-0.02	3.7	49.5	7.1
	27-037-0470	9.3	8.3	0.19	-1.0	-10.4	8.2	9.3	0.06	0.0	-0.2	9.3	8.3	0.04	-1.0	-10.6	8.7
	27-053-0963	9.0	10.4	0.06	1.4	15.6	8.5	11.1	0.05	2.0	22.4	9.5	9.5	0.02	0.5	5.5	7.9
	27-171-3201	12.4	6.5	0.11	-5.9	-47.6	9.8	7.0	0.22	-5.4	-43.7	9.4	6.7	0.10	-5.7	-46.3	9.8
	31-153-0007	12.6	11.4	-0.11	-1.2	-9.3	25.6	14.7	0.02	2.1	16.3	25.8	10.5	-0.08	-2.1	-16.8	25.3
	38-017-1004	13.2	5.2	0.02	-8.0	-60.5	19.5	5.6	0.07	-7.6	-57.3	19.3	4.9	0.02	-8.3	-62.6	19.6
	46-099-0008	10.0	8.0	0.15	-2.0	-19.9	5.8	8.7	0.18	-1.3	-12.9	6.2	7.4	0.04	-2.6	-25.9	6.2
	46-127-0001	6.0	7.7	-0.03	1.8	29.5	6.2	9.1	0.09	3.1	51.8	7.4	7.3	0.01	1.4	22.6	5.9
	East Average	**9.8**	**8.9**	**0.05**	**-0.9**	**-2.1**	**9.8**	**10.3**	**0.10**	**0.6**	**12.5**	**10.8**	**8.7**	**0.03**	**-1.0**	**-4.7**	**9.6**
	30-075-0001	5.5	3.4	-0.02	-2.1	-38.2	8.5	3.2	0.05	-2.3	-41.2	8.5	2.7	-0.03	-2.8	-50.5	8.7
	30-087-0001	5.9	3.2	-0.08	-2.7	-45.3	5.7	3.1	0.02	-2.8	-47.5	5.7	2.6	-0.01	-3.3	-56.2	5.9
	38-007-0002	6.7	3.1	-0.02	-3.6	-54.4	5.4	2.9	0.08	-3.8	-47.5	5.5	2.7	0.00	-4.0	-59.9	5.7
	38-053-0002	3.4	3.1	-0.01	-0.4	-11.0	4.3	2.9	0.01	-0.6	-16.7	4.4	2.6	0.06	-0.8	-23.8	4.3
	46-071-0001	3.0	4.5	0.16	1.5	50.5	3.9	4.5	0.23	1.5	50.5	4.4	3.7	0.27	0.7	24.8	3.3
	56-005-1899	4.5	4.5	0.29	0.0	-0.4	3.3	4.3	0.30	-0.2	-5.3	3.4	3.6	0.23	-1.0	-21.5	3.5
	West Average	**4.8**	**3.6**	**0.05**	**-1.2**	**-16.5**	**5.2**	**3.5**	**0.11**	**-1.4**	**-18.0**	**5.3**	**3.0**	**0.09**	**-1.9**	**-31.2**	**5.2**
	Total Average	**8.1**	**7.1**	**0.05**	**-1.0**	**-6.9**	**8.2**	**8.1**	**0.10**	**-0.1**	**2.4**	**9.0**	**6.8**	**0.05**	**-1.3**	**-13.5**	**8.1**

Table S9. Statistical analysis of predicted daily average $PM_{2.5}$ elemental carbon (EC) concentrations at individual monitoring sites during July 2010 for the RACM-MADE/SORGAM (RM), CBMZ-MOSAIC (CM), and MOZART-MOSAIC (MM) chemistry-aerosol mechanisms. Comparison is made with daily average observation data collected every third day.

			RACM-MADE/SORGAM					**CBMZ-MOSAIC**					**MOZART-MOSAIC**				
	AQS Site ID	**M_{obs}**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**
EC ($\mu g/m^3$)	19-137-0002	0.34	0.28	0.38	-0.06	-17	0.16	0.33	0.31	-0.01	-2	0.16	0.35	0.19	0.00	2	0.17
	19-177-0006	0.19	0.31	0.13	0.12	63	0.15	0.39	0.08	0.20	108	0.23	0.34	0.09	0.15	81	0.18
	27-075-0005	0.18	0.05	0.26	-0.13	-70	0.15	0.09	0.50	-0.09	-50	0.11	0.10	-0.06	-0.08	-43	0.12
	27-133-9000	0.19	0.23	0.32	0.03	17	0.10	0.27	0.36	0.07	38	0.12	0.27	0.26	0.07	38	0.13
	27-137-0034	0.20	0.07	0.42	-0.13	-66	0.16	0.10	0.41	-0.09	-48	0.13	0.11	-0.13	-0.09	-44	0.14
	27-169-9000	0.23	0.29	0.44	0.06	27	0.10	0.35	0.32	0.12	523	0.15	0.31	0.74	0.08	35	0.10
	East Average	**0.22**	**0.20**	**0.32**	**-0.02**	**-8**	**0.14**	**0.25**	**0.33**	**0.03**	**16**	**0.15**	**0.25**	**0.18**	**0.02**	**11**	**0.14**
	30-085-9000	0.08	0.14	0.22	0.06	82	0.07	0.16	0.29	0.08	112	0.10	0.13	0.37	0.05	69	0.06
	30-087-0762	0.10	0.06	0.39	-0.04	-39	0.05	0.08	0.46	-0.02	-23	0.04	0.08	0.67	-0.03	-27	0.04
	30-091-9000	0.11	0.15	0.68	0.04	38	0.05	0.17	0.75	0.06	60	0.07	0.13	0.62	0.02	21	0.04
	31-069-9000	0.13	0.16	0.54	0.02	18	0.05	0.19	0.61	0.06	45	0.08	0.17	0.76	0.04	31	0.05
	31-171-9000	0.15	0.15	0.60	0.00	3	0.05	0.19	0.53	0.04	28	0.07	0.19	0.54	0.05	31	0.07
	38-007-0002	0.15	0.13	0.44	-0.02	-13	0.04	0.16	0.43	0.00	3	0.04	0.12	0.35	-0.03	-18	0.05
	38-013-0004	0.31	0.15	0.50	-0.15	-49	0.24	0.18	0.35	-0.12	-41	0.23	0.16	0.37	-0.15	-49	0.24
	46-033-0132	0.11	0.10	0.80	-0.01	-9	0.02	0.12	0.76	0.01	12	0.03	0.12	0.65	0.02	14	0.03
	46-071-0001	0.11	0.10	0.33	-0.02	-14	0.05	0.12	0.36	0.01	9	0.05	0.12	0.19	0.01	8	0.05
	West Average	**0.14**	**0.13**	**0.61**	**-0.01**	**2**	**0.07**	**0.15**	**0.50**	**0.01**	**23**	**0.08**	**0.14**	**0.50**	**0.00**	**9**	**0.07**
	Total Average	**0.17**	**0.16**	**0.43**	**-0.01**	**-2.1**	**0.10**	**0.19**	**0.43**	**0.02**	**20**	**0.11**	**0.18**	**0.37**	**0.01**	**10**	**0.10**

Table S10. Statistical analysis of predicted daily average $PM_{2.5}$ organic carbon (OC) concentrations at individual monitoring sites during July 2010 for the RACM-MADE/SORGAM (RM), CBMZ-MOSAIC (CM), and MOZART-MOSAIC (MM) chemistry-aerosol mechanisms. Comparison is made with daily average observation data collected every third day.

			RACM-MADE/SORGAM					**CBMZ-MOSAIC**					**MOZART-MOSAIC**				
	AQS Site ID	**M_{obs}**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**
OC ($\mu g/m^3$)	19-137-0002	1.16	0.24	0.74	-0.92	-80	0.99	0.42	0.74	-0.74	-63	0.81	1.14	-0,24	1.14	-2	0.58
	19-177-0006	1.03	0.28	0.07	-0.74	-73	0.78	0.54	0.10	-0.49	-47	0.55	1.45	-0,03	1.45	41	0.76
	27-075-0005	1.90	0.30	0.85	-1.60	-84	1.82	0.60	0.90	-1.30	-68	1.47	1.07	0,85	1.07	-44	1.09
	27-133-9000	0.99	0.31	0.69	-0.68	-69	0.73	0.50	0.74	-0.49	-49	0.54	0.80	0,06	0.80	-19	0.42
	27-137-0034	1.91	0.40	0.74	-1.51	-79	1.71	0.71	0.83	-1.20	-63	1.36	1.16	0,83	1.16	-39	0.99
	27-169-9000	1.32	0.36	0.60	-0.96	-73	1.05	0.60	0.56	-0.72	-55	0.83	1.24	-0,10	1.24	-6	0.65
	East Average	**1.38**	**0.31**	**0.62**	**-1.07**	**-76**	**1.18**	**0.56**	**0.64**	**-0.82**	**-58**	**0.93**	**1.14**	**0,23**	**1.14**	**-11**	**0.75**
	30-085-9000	1.10	0.32	-0.36	-0.77	-71	0.98	0.38	-0.24	-0.72	-66	0.90	0.45	0,59	0.45	-59	0.78
	30-087-0762	0.95	0.24	0.02	-0.71	-75	0.77	0.28	0.60	-0.67	-71	0.72	0.41	0,67	0.41	-57	0.60
	30-091-9000	0.95	0.34	0.21	-0.61	-64	0.68	0.40	0.42	-0.55	-57	0.61	0.47	0,25	0.47	-51	0.56
	31-069-9000	1.17	0.19	0.63	-0.98	-83	1.06	0.30	0.73	-0.87	-57	0.61	0.53	0,61	0.53	-55	0.75
	31-171-9000	1.07	0.16	0.32	-0.91	-85	0.96	0.30	0.58	-0.77	-72	0.82	0.60	0,53	0.60	-44	0.54
	38-007-0002	1.07	0.29	-0.05	-0.78	-73	0.85	0.34	0.39	-0.73	-68	0.78	0.46	0,43	0.46	-57	0.67
	38-013-0004	1.16	0.39	0.62	-0.77	-66	0.83	0.51	0.53	-0.65	-56	0.73	0.63	0,39	0.63	-46	0.65
	46-033-0132	0.93	0.22	0.20	-0.70	-76	0.75	0.30	0.65	-0.63	-68	0.66	0.48	0,81	0.48	-48	0.48
	46-071-0001	1.02	0.20	-0.15	-0.82	-81	0.90	0.30	0.65	-0.72	-70	0.77	0.50	0,58	0.50	-51	0.59
	West Average	**1.05**	**0.26**	**0.16**	**-0.78**	**-75**	**0.86**	**0.35**	**0.48**	**-0.70**	**-65**	**0.73**	**0.50**	**0,54**	**0.50**	**-52**	**0.62**
	Total Average	**1.18**	**0.28**	**0.34**	**-0.90**	**-75**	**0.99**	**0.43**	**0.55**	**-0.75**	**-62**	**0.81**	**0.76**	**0.42**	**0.76**	**-36**	**0.67**

Table S11. Statistical analysis of predicted daily average $PM_{2.5}$ nitrate (NO_3) concentrations at individual monitoring sites during July 2010 for the RACM-MADE/SORGAM (RM), CBMZ-MOSAIC (CM), and MOZART-MOSAIC (MM) chemistry-aerosol mechanisms. Comparison is made with daily average observation data collected every third day.

			RACM-MADE/SORGAM					CBMZ-MOSAIC					MOZART-MOSAIC				
	AQS Site ID	M_{obs}	M	*R*	MB	NMB (%)	RMSE	M	*R*	MB	NMB (%)	RMSE	M	*R*	MB	NMB (%)	RMSE
NO_3 ($\mu g/m^3$)	19-137-0002	0.28	0.27	0.49	-0.01	-2	0.20	0.72	0.04	0.44	157	0.59	1.07	0.54	0.79	283	1.05
	19-153-0030	0.15	0.76	0.05	0.60	398	0.76	1.66	-0.08	1.51	1001	1.25	1.44	-0.27	1.29	855	1.72
	19-163-0015	0.33	0.91	0.29	0.58	173	0.88	1.71	0.36	1.38	420	1.04	1.22	0.45	0.89	269	1.18
	19-177-0006	0.16	0.79	-0.56	0.63	396	0.99	1.47	-0.28	1.31	823	1.86	1.29	-0.24	1.13	709	1.58
	27-075-0005	0.04	0.01	-0.10	-0.03	-78	0.05	0.04	0.32	0.00	-8	0.07	0.15	0.13	0.11	238	0.22
	27-109-5008	0.44	0.51	0.67	0.07	15	0.39	0.82	0.77	0.38	87	0.44	0.91	0.48	0.47	107	1.08
	27-133-9000	0.32	0.52	-0.07	0.20	62	0.72	0.72	0.15	0.40	124	0.81	0.87	-0.01	0.55	171	1.33
	27-137-0034	0.04	0.01	0.74	-0.04	-87	0.04	0.02	0.90	-0.02	-53	0.03	0.12	0.76	0.08	182	0.18
	27-169-9000	0.19	0.57	0.88	0.38	205	0.72	0.78	0.88	0.60	318	0.98	0.94	0.87	0.75	402	1.19
	31-055-0019	0.59	0.43	0.01	-0.16	-28	0.54	1.55	0.09	0.96	163	1.62	1.24	0.04	0.65	111	1.26
	38-017-1004	0.23	0.08	0.14	-0.15	-66	0.21	0.18	0.58	-0.05	-22	0.20	0.16	0.28	-0.07	-30	0.19
	46-099-0008	0.48	1.13	-0.21	0.64	134	1.50	1.64	0.01	1.16	241	0.76	1.35	0.03	0.87	180	1.64
	East Average	**0.27**	**0.50**	**0.19**	**0.23**	**42**	**0.58**	**0.94**	**0.31**	**0.67**	**271**	**0.80**	**0.90**	**0.26**	**0.63**	**290**	**1.05**
	30-085-9000	0.05	0.00	0.21	-0.05	-94	0.05	0.01	0.27	-0.04	-83	0.05	0.01	0.50	-0.04	-80	0.04
	30-087-0762	0.06	0.00	0.32	-0.06	-99	0.06	0.01	0.63	-0.05	-87	0.06	0.00	0.33	-0.06	-96	0.06
	30-091-9000	0.07	0.00	0.29	-0.07	-97	0.07	0.01	0.34	-0.06	-89	0.07	0.02	0.49	-0.05	-77	0.06
	31-069-9000	0.17	0.06	0.51	-0.11	-66	0.14	0.23	0.47	0.07	40	0.20	0.31	0.61	0.14	87	0.19
	31-171-9000	0.15	0.12	0.57	-0.03	-21	0.17	0.20	0.02	0.05	35	0.18	0.27	0.23	0.12	79	0.27
	38-007-0002	0.06	0.01	0.55	-0.05	-79	0.05	0.02	0.44	-0.04	-64	0.05	0.05	0.42	-0.01	-21	0.09
	38-013-0004	0.13	0.01	0.62	-0.12	-91	0.13	0.03	0.31	-0.10	-78	0.12	0.07	0.67	-0.06	-49	0.11
	46-033-0132	0.08	0.00	-0.05	-0.07	-94	0.08	0.02	-0.30	-0.06	-80	0.07	0.02	-0.45	-0.06	-77	0.07
	46-071-0001	0.12	0.04	0.14	-0.08	-69	0.14	0.07	0.02	-0.05	-39	0.16	0.05	-0.40	-0.07	-57	0.16
	West Average	**0.10**	**0.03**	**0.35**	**-0.07**	**-79**	**0.10**	**0.07**	**0.24**	**-0.03**	**-49**	**0.11**	**0.09**	**0.27**	**-0.01**	**-32**	**0.12**
	Total Average	**0.20**	**0.30**	**0.26**	**0.10**	**-10**	**0.38**	**0.57**	**0.28**	**0.37**	**134**	**0.50**	**0.55**	**0.26**	**0.35**	**152**	**0.65**

Table S12. Statistical analysis of predicted daily average $PM_{2.5}$ ammonium (NH_4) concentrations at individual monitoring sites during July 2010 for the RACM-MADE/SORGAM (RM), CBMZ-MOSAIC (CM), and MOZART-MOSAIC (MM) chemistry-aerosol mechanisms. Comparison is made with daily average observation data collected every third day.

			RACM-MADE/SORGAM					**CBMZ-MOSAIC**					**MOZART-MOSAIC**				
	AQS Site ID	**M_{obs}**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**	**M**	***R***	**MB**	**NMB (%)**	**RMSE**
NH_4 ($\mu g/m^3$)	19-153-0030	0.37	0,93	-0.43	0.57	154	0.84	0.61	-0.42	0.25	68	0.42	0.75	-0.16	0.39	0	0.62
	19-163-0015	0.70	0,81	0.38	0.11	16	0.50	0.73	0.18	0.03	4	0.34	0.12	0.43	-0.58	-83	0.78
	27-109-5008	0.51	0,73	0.61	0.22	45	0.32	0.36	0.90	-0.14	-28	0.43	0.59	0.29	0.08	0	0.38
	31-055-0019	0.52	0,67	0.09	0.15	29	0.42	0.59	0.30	0.07	14	0.28	0.68	0.19	0.16	31	0.45
	38-017-1004	0.24	0,48	-0.35	0.25	105	0.40	0.24	-0.43	0.01	3	0.35	0.45	-0.35	0.21	90	0.30
	46-099-0008	0.62	0,89	-0.38	0.27	44	0.90	0.66	-0.17	0.05	7	0.40	1.32	-0.33	0.70	113	0.91
	Total Average	**0.49**	**0.75**	**-0.01**	**0.26**	**65**	**0.56**	**0.53**	**0.06**	**0.04**	**11**	**0.37**	**0.65**	**0.01**	**0.16**	**25**	**0.57**

Table S13. Statistical analysis of predicted daily average $PM_{2.5}$ sulfate (SO_4) concentrations at individual monitoring sites during July 2010 for the RACM-MADE/SORGAM (RM), CBMZ-MOSAIC (CM), and MOZART-MOSAIC (MM) chemistry-aerosol mechanisms. Comparison is made with daily average observation data collected every third day.

			RACM-MADE/SORGAM					CBMZ-MOSAIC					MOZART-MOSAIC				
	AQS Site ID	M_{obs}	M	*R*	MB	NMB (%)	RMSE	M	*R*	MB	NMB (%)	RMSE	M	*R*	MB	NMB (%)	RMSE
SO_4 ($\mu g/m^3$)	19-113-0040	1.77	1.38	0.39	-0.39	-22	0.87	0.49	0.24	-1.28	-72	1.11	1.24	0.53	-0.53	-30	0.84
	19-137-0002	1.78	1.36	0.05	-0.42	-24	0.90	0.49	-0.02	-1.30	-73	1.43	1.22	0.09	-0.57	-32	0.83
	19-153-0030	1.49	1.82	0.07	0.33	22	1.10	0.40	0.15	-1.09	-73	1.71	1.18	0.19	-0.31	-21	0.56
	19-163-0015	2.29	1.36	0.42	-0.94	-40	1.42	0.55	0.28	-1.74	-76	1.04	1.34	0.52	-0.95	-41	1.38
	19-177-0006	1.54	1.60	0.23	0.07	4	1.27	0.46	0.24	-1.08	-70	1.24	1.24	0.51	-0.29	-19	0.63
	27-075-0005	0.55	0.65	-0.06	0.10	19	0.46	0.49	0.27	-0.05	-10	0.30	1.04	0.31	0.49	90	0.58
	27-109-5008	1.46	1.48	0.13	0.02	2	0.84	0.37	0.09	-1.09	-75	1.31	1.16	0.37	-0.30	-21	0.72
	27-133-9000	1.26	1.22	-0.14	-0.04	-3	1.08	0.47	-0.07	-0.79	-63	1.08	1.18	-0.15	-0.08	-6	0.81
	27-137-0034	0.59	0.71	0.34	0.12	20	0.36	0.53	0.00	-0.07	-11	0.34	1.07	0.10	0.47	79	0.55
	27-169-9000	1.18	1.17	0.27	-0.01	-1	0.70	0.43	0.01	-0.75	-64	1.01	1.13	0.40	-0.05	-4	0.61
	31-055-0019	2.85	1.37	0.00	-1.49	-52	2.77	0.48	-0.60	-2.37	-83	1.06	1.24	-0.46	-1.61	-56	2.89
	38-017-1004	1.18	1.11	0.34	-0.07	-6	0.78	0.52	-0.51	-0.65	-56	0.91	1.15	-0.23	-0.03	-3	0.80
	46-099-5008	1.79	1.38	-0.48	-0.41	-23	1.58	0.54	-0.26	-1.25	-70	1.12	1.32	-0.45	-0.47	-26	1.26
	East Average	**1.52**	**1.28**	**-0.12**	**-0.24**	**-8**	**1.09**	**0.48**	**-0.01**	**-1.04**	**-61**	**1.05**	**1.19**	**0.13**	**-0.33**	**-7**	**0.96**
	30-085-9000	0.46	0.66	0.62	0.20	44	0.28	0.52	-0.85	0.06	13	0.39	0.98	-0.47	0.52	112	0.61
	30-087-0762	0.45	1.15	0.13	0.71	159	1.03	0.61	-0.16	0.17	37	0.38	1.19	-0.13	0.75	168	0.85
	30-091-9000	0.47	0.67	0.61	0.21	44	0.29	0.52	-0.85	0.05	10	0.38	0.97	-0.35	0.50	106	0.58
	31-069-9000	1.19	1.45	-0.48	0.26	22	0.98	0.74	0.29	-0.45	-38	0.75	1.38	-0.01	0.19	16	0.75
	31-171-9000	0.98	2.14	-0.19	1.16	118	1.83	0.75	0.06	-0.22	-23	0.55	1.58	-0.31	0.60	62	0.95
	38-007-0002	0.62	0.99	0.52	0.37	61	0.59	0.55	-0.63	-0.07	-11	0.45	1.04	-0.33	0.43	69	0.56
	38-013-0004	0.85	0.81	0.61	-0.04	-5	0.39	0.54	-0.73	-0.31	-37	0.69	1.08	-0.26	0.22	26	0.63
	46-033-0132	0.55	1.55	-0.29	0.99	180	1.46	0.70	-0.19	0.15	27	0.48	1.40	-0.28	0.85	154	1.08
	46-071-0001	0.66	1.49	-0.22	0.84	128	1.36	0.60	-0.07	-0.05	-8	0.48	1.24	-0.27	0.59	90	0.87
	West Average	**0.69**	**1,21**	**0.15**	**0,52**	**83.4**	**0,91**	**0.62**	**-0.35**	**-0.08**	**-3**	**0.51**	**1.21**	**-0.27**	**0.52**	**89**	**0.76**
	Total Average	**1.18**	**1,25**	**0.13**	**0,07**	**29.3**	**1,01**	**0.53**	**-0.15**	**-0.65**	**-37**	**0.83**	**1.20**	**-0.03**	**0.02**	**32**	**0.88**